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NEW JERSEY DEPT OF ENVIRONMENTAL PROTECTION TRENTON
NATIONAL DAM SAFETY PROGRAM. DALRYMPLE POND DAM (NJ-00350). PAS--ETC(U)
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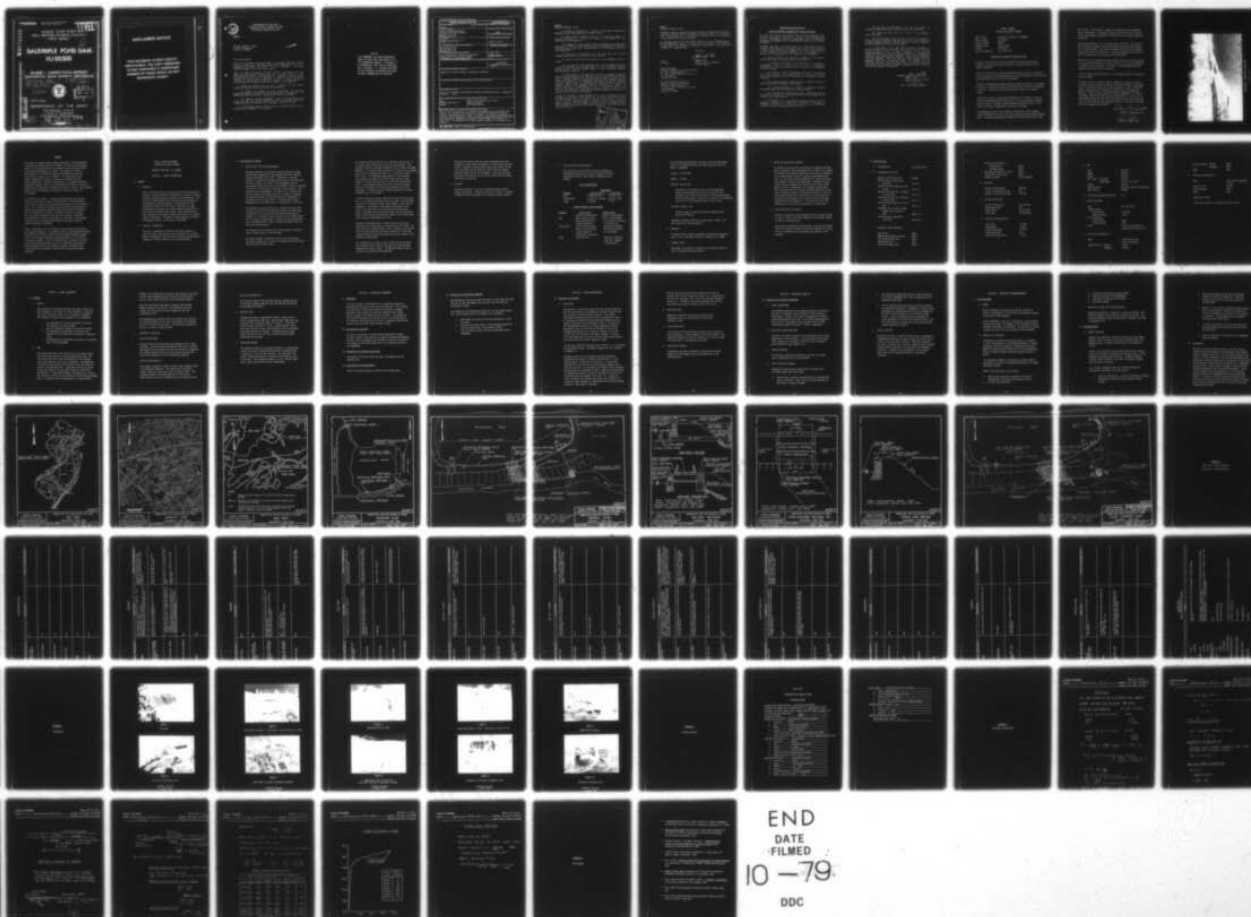
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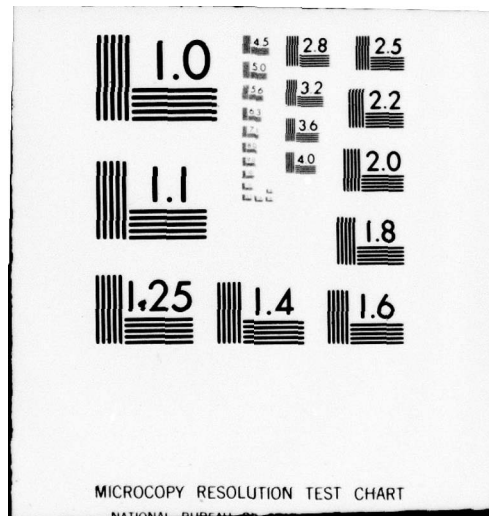
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PASSAIC RIVER BASIN
MILL BROOK, MORRIS COUNTY
NEW JERSEY

LEVEL #

DALRYMPLE POND DAM
NJ 00350

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM.

Dalrymple Pond Dam (NJ-00350).
Passaic River Basin. Mill Brook,
Morris County, New Jersey,
Phase 1 Inspection Report.

Richard J. /McDermott
John E. /Gribbin

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DEPARTMENT OF THE ARMY

Philadelphia District
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IN REPLY REFER TO
NAPEN-D

Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, NJ 08621

25 SEP 1979

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for Dalrymple Pond Dam in Morris County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, Dalrymple Pond Dam, initially listed as a high hazard potential structure, but reduced to a significant hazard potential structure as a result of this inspection, is judged to be in fair overall condition and the spillway is considered adequate. To insure adequacy of the structure, the following actions, as a minimum, are recommended:

a. Within six months from the date of approval of this report, engineering studies and analyses should be performed to:

(1) Monitor the seepage by visual observation. If necessary, measurements should be made by the use of appropriate instrumentation. The monitoring should be included in the permanent records of the dam.

(2) Prepare a detailed topographic survey of the dam and the area around the dam. The survey should be related to existing construction drawings and should become part of the permanent records of the dam.

b. The following remedial actions should be completed within one year from the date of approval of this report:

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.			

NAPEN-D

Honorable Brendan T. Byrne

(1) Auxiliary Spillway No. 1 should be thoroughly renovated by patching, grouting and coating with an epoxy sealant.

(2) The junction between the dam and the discharge channel for Auxiliary Spillway No. 1 should be protected from erosion by the construction of training walls.

(3) Because it is not properly protected against erosion, Auxiliary Spillway No. 2 should be eliminated by filling the embankment to provide a level dam crest in that area. The embankment should be properly stabilized after being filled.

(4) The area of settlement in the dam crest above the spillway discharge pipe should be properly filled and stabilized.

(5) Trees and brush which are present on the embankment should be removed.

(6) The low area in the pond bank should not be allowed to serve as an area of discharge from the pond since it is not adequately protected against erosion. Remedial measures should be taken to prevent discharge over the banks of the pond.

(7) The owner of the dam should initiate a program of periodic inspection and maintenance, the complete records of which should be kept on file. A visual inspection of the dam and appurtenances should be made annually and reported on a standardized check-list form. Repairs should be made as required and the following maintenance should be performed annually: remove adverse vegetation from the embankment, fill and sod any eroded surfaces of the embankment and clear the downstream channel. In addition, the lake should be lowered at least once every five years at which time the lake should be cleaned and the normally submerged portions of the dam and spillway inspected and repaired.

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman James A. Courter of the Thirteenth District. Under the provision of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

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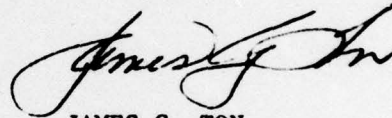
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Honorable Brendan T. Byrne

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

An important aspect of the Dam Safety Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely,



JAMES G. TON
Colonel, Corps of Engineers
District Engineer

1 Incl
As stated

Copies furnished:

Mr. Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

Mr. John O'Dowd, Acting Chief
Bureau of Flood Plain Management
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

DALRYMPLE POND DAM (NJ00350)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 30 April 1979 by Storch Engineers under contract to the State of New Jersey. The State, under agreement with the U.S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

Dalrymple Pond Dam, initially listed as a high hazard potential structure, but reduced to a significant hazard potential structure as a result of this inspection, is judged to be in fair overall condition and the spillway is considered adequate. To insure adequacy of the structure, the following actions, as a minimum, are recommended:

a. Within six months from the date of approval of this report, engineering studies and analyses should be performed to:

(1) Monitor the seepage by visual observation. If necessary, measurements should be made by the use of appropriate instrumentation. The monitoring should be included in the permanent records of the dam.

(2) Prepare a detailed topographic survey of the dam and the area around the dam. The survey should be related to existing construction drawings and should become part of the permanent records of the dam.

b. The following remedial actions should be completed within one year from the date of approval of this report:

(1) Auxiliary Spillway No. 1 should be thoroughly renovated by patching, grouting and coating with an epoxy sealant.

(2) The junction between the dam and the discharge channel for Auxiliary Spillway No. 1 should be protected from erosion by the construction of training walls.

(3) Because it is not properly protected against erosion, Auxiliary Spillway No. 2 should be eliminated by filling the embankment to provide a level dam crest in that area. The embankment should be properly stabilized after being filled.

(4) The area of settlement in the dam crest above the spillway discharge pipe should be properly filled and stabilized.

(5) Trees and brush which are present on the embankment should be removed.

(6) The low area in the pond bank should not be allowed to serve as an area of discharge from the pond since it is not adequately protected against erosion. Remedial measures should be taken to prevent discharge over the banks of the pond.

(7) The owner of the dam should initiate a program of periodic inspection and maintenance, the complete records of which should be kept on file. A visual inspection of the dam and appurtenances should be made annually and reported on a standardized check-list form. Repairs should be made as required and the following maintenance should be performed annually: remove adverse vegetation from the embankment, fill and sod any eroded surfaces of the embankment and clear the downstream channel. In addition, the lake should be lowered at least once every five years at which time the lake should be cleaned and the normally submerged portions of the dam and spillway inspected and repaired.

APPROVED: 

JAMES G. TON

Colonel, Corps of Engineers
District Engineer

DATE: 22 Sep 1979

PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Dalrymple Pond Dam, I.D. NJ00350
State Located: New Jersey
County Located: Morris
Drainage Basin: Passaic River
Stream: Mill Brook
Date of Inspection: April 30, 1979

Assessment of General Condition of Dam

Based on visual inspection, past operational performance and Phase I engineering analyses, Dalrymple Pond Dam is assessed as being in fair overall condition.

Based on investigations of the downstream flood plain made in connection with this report, it is recommended that the hazard potential classification be downgraded from high to significant hazard.

Hydraulic and hydrologic analyses indicate that the spillways are adequate to pass the designated spillway design flood (SDF) without an overtopping of the dam. (The SDF for Dalrymple Pond Dam is equal to a 100-year storm).

However the low area in the pond bank should not be allowed to serve as an area of discharge from the pond since it is not adequately protected against erosion. Therefore, remedial measures should be taken in the future to prevent discharge over the banks of the pond.

The embankment appears to be outwardly structurally stable although slight settlement is present in the dam crest above the spillway discharge pipe. The settled area should be properly filled and stabilized in the

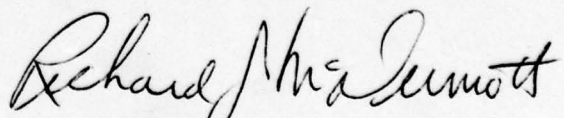
near future. Three zones of seepage were observed on the downstream face of embankment. Arrangements should be made in the near future to monitor the seepage to determine its effect on the structural stability of the dam.

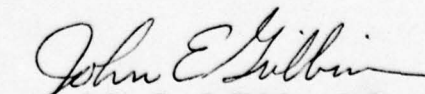
Auxiliary Spillway No. 1 is in a deteriorated condition. The concrete weir should be thoroughly renovated by patching, grouting and coating with an epoxy sealant. The junction between the dam and the discharge channel for Auxiliary Spillway No. 1 should be protected from erosion in the near future by the construction of training walls.

Because it is not properly protected against erosion, Auxiliary Spillway No. 2 should be eliminated in the near future by filling the embankment to produce a level dam crest in that area. The embankment should be properly stabilized after being filled.

Trees and brush which are present on the embankment should be removed in the near future.

The owner should, in the near future, implement a program of periodic inspection and maintenance for the dam which would include a topographic survey to provide a record of existing conditions. Repairs should be made as required and the following maintenance should be performed annually: remove adverse vegetation from the embankment, fill and sod any eroded surfaces and clear the downstream channel. As part of the maintenance program the lake should be lowered at least once every five years at which time normally submerged portions of the dam and spillway should be inspected and repaired.


Richard J. McDermott, P.E.


John E. Gribbin, P.E.



OVERVIEW - DALRYMPLE POND DAM

30 APRIL 1979

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 30214. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. It is important to note that the condition of dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that the unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

DALRYMPLE POND DAM, I.D. NJ00350

SECTION 1: PROJECT INFORMATION

1.1 General

a. Authority

Public Law 92-367, August 8, 1972 authorized the Secretary of the Army, through the Corps of Engineers to initiate a National Program of Dam Inspections throughout the United States. The Division of Water Resources of the New Jersey Department of Environmental Protection (NJDEP) in cooperation with the Philadelphia District of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the State of New Jersey. Storch Engineers has been retained by the NJDEP to inspect and report on a selected group of these dams. The NJDEP is under agreement with the Philadelphia District of the Corps of Engineers.

b. Purpose of Inspection

The visual inspection of Dalrymple Pond Dam was made on April 30, 1979. The purpose of the inspection was to make a general assessment of the structural integrity and operational adequacy of the dam structure and its appurtenances.

1.2 Description of Project

a. Description of Dam and Appurtenances

Dalrymple Pond Dam is an earthfill dam with three spillways. The earthfill embankment is approximately 660 feet long and extends approximately east-west. Reportedly, a concrete corewall is located at the approximate center of the dam along its entire length. The width of the embankment crest is approximately 13 feet for most of the length of dam but increases to 40 feet in the vicinity of the drop inlet spillway. The upstream face of embankment is vertical and is protected by a concrete capped stone masonry wall for a length of 350 feet. The remaining portion of the upstream face of embankment is protected by a stone rubble wall. The downstream face of embankment has an average slope of 3 horizontal to 1 vertical.

The primary or service spillway is a concrete box drop-inlet spillway with an 18-inch reinforced concrete discharge pipe. It functions in both controlled and uncontrolled modes as follows: 1) The walls of the drop-inlet form an uncontrolled weir 11.6 feet in length and 2) Stoplogs at the upstream end form a controlled weir 2 feet in length discharging into the main drop-inlet structure.

The stoplogs at the upstream end of the spillway can also be used as outlet works to drain the lake.

An 18-inch diameter reinforced concrete pipe transversely penetrates the dam and is used as a discharge culvert for both the spillway and outlet works.

An auxiliary spillway referred to as Auxiliary Spillway No. 1, is located about 30 feet west of the service spillway. This spillway utilizes a concrete notched weir which allows two-staged operation. The primary stage consists of a crudely cut rectangular notch 9 feet in length with crest set 1.7 feet above normal water level. The secondary stage consists of two concrete weir sections (on either side of the notch) having a total length of 12 feet with crest set 3.2 feet above normal water level. The discharge channel consists of an earth channel with rock lined bottom cut into the downstream side of the embankment. A timber and steel walkway supported by concrete abutments spans the spillway.

A second auxiliary spillway, referred to as Auxiliary Spillway No. 2, is located near the west end of the dam. This spillway consists of a trapezoidal grass lined channel in the crest of embankment. The bottom of the channel corresponds to the crest of spillway and is set 4.2 feet above normal water level. Discharge from the spillway flows over the downstream slope of dam and into the diversion stream of Mill Brook which flows along the downstream toe of dam.

Upstream of Dalrymple Pond a concrete diversion dike with provision for a stoplog gate is located across Mill Brook. At that point, Mill Brook branches into two streams, one of which flows into the pond while the other consists of a diversion stream which flows around the pond and joins Mill Brook at the spillway discharge pipe.

The elevation of the crest of dam is 829.5 (N.G.V.D.) while the elevation of the crest of the drop inlet spillway (and normal water level) is 824.3. The maximum height of dam is 16 feet at the spillway discharge pipe.

The bank of the pond along its eastern perimeter has a top elevation of 828.5 which corresponds to 1 foot below the crest of dam. Therefore, during times of high water levels in the pond, discharge from the pond will occur along its eastern perimeter before the dam is overtopped. Discharge over this bank would flow over an area of fill and then into Mill Brook downstream from the dam.

b. Location

Dalrymple Pond Dam is located in Randolph Township, Morris County, New Jersey. Constructed across Mill Brook, it impounds Dalrymple Pond on the campus of the County College of Morris.

c. Size and Hazard Classification

Size and Hazard Classification criteria presented in "Recommended Guidelines for Safety Inspection of Dams", published by the U.S. Army Corps of Engineers are as follows:

SIZE CLASSIFICATION

<u>Category</u>	<u>Impoundment</u>	
	<u>Storage (Ac-ft)</u>	<u>Height (Ft)</u>
Small	< 1000 and ≥ 50	< 40 and ≥ 25
Intermediate	≥ 1000 and < 50,000	≥ 40 and < 100
Large	$\geq 50,000$	≥ 100

HAZARD POTENTIAL CLASSIFICATION

<u>Category</u>	<u>Loss of Life</u> (Extent of Development)	<u>Economic Loss</u> (Extent of Development)
Low	None expected (no permanent structures for human habitation)	Minimal (Undeveloped to occasional structures or agriculture)
Significant	Few (No urban developments and no more than a small number of inhabitable structures)	Appreciable (Notable agriculture, industry or structures)
High	More than few	Excessive (Extensive community, industry or agriculture)

The following characteristics relating to size and downstream hazard for Dalrymple Pond Dam have been determined for this Phase I assessment:

Storage = 73 acre-feet

Height = 16 feet

Potential Loss of Life

One dwelling is located 150 feet from the downstream channel approximately 450 feet from the dam and one secondary road (Center Grove Road) is located approximately 200 feet from the dam. Failure of the dam due to overtopping could result in the potential loss of a few lives.

Potential Economic Loss

Possible damage to Center Grove Road Bridge 200 feet downstream from dam.

Therefore, Dalrymple Pond Dam is classified as "Small" size and "Significant" hazard potential.

d. Ownership

Dalrymple Pond is owned and operated by the County College of Morris, Rt. 10 and Center Grove Rd., Randolph, N.J. 07869.

e. Purpose of Dam

Reportedly, the purpose of the dam is to impound a lake for use in irrigation and flood control.

f. Design and Construction History

No records of the original construction of Dalrymple Pond Dam which, reportedly, was constructed prior to 1900, are available. The original dam extended around the south and east perimeters of the pond and had an overall length of approximately 900 feet. In 1972 the dam was overtopped and a breach occurred at the southeast section of the embankment. Subsequent to that breach, the area downstream of the east end of the original dam was filled in preparation for a proposed parking area. Thus, the east end of the dam was eliminated resulting in the present 660-foot long dam. Following the breach in 1972, the pond remained empty until 1977 at which time the drop inlet spillway was constructed and the original service spillway became Auxiliary Spillway No. 1. The notch was cut in the concrete crest of Auxiliary Spillway No. 1 at that time.

g. Normal Operational Procedure

The dam is operated by the maintenance staff of County College of Morris. There is no fixed schedule of maintenance; repairs are made as the need arises.

Reportedly, the upstream diversion gate is used during intense storms to divert flow around the pond and stoplogs in the drop inlet are sometimes pulled to augment the capacity of the spillway.

1.3 Pertinent Data

a. Drainage Area 0.6 square miles

b. Discharge at Dam Site

Maximum flood at dam site Unknown

Outlet works at normal pool
elevation 19 c.f.s.

Service spillway capacity at top
of dam 32 c.f.s.

Auxiliary Spillway No. 1 capacity
at top of dam 251 c.f.s.

Auxiliary Spillway No. 2 capacity
at top of dam 58 c.f.s.

Total spillway capacity at top of
dam 341 c.f.s.

Discharge over low bank of pond
(water level at top of
dam) 830 c.f.s.

Total discharge from pond at
top of dam 1171 c.f.s.

c. Elevation (Feet above MSL)

Top of Dam 829.5

Maximum pool-design surcharge 829.5

Full flood control pool 824.3

Recreational pool N.A.

Service spillway crest 824.3

Auxiliary Spillway No. 1

Primary crest	826.0
Secondary crest	827.5
Auxiliary spillway No. 2 crest	828.5
Stream bed at toe of dam	816.7
Maximum tailwater	820 (Estimated)

d. Reservoir

Length of maximum pool	980 feet
Length of recreational pool	N.A.
Length of flood control pool	700 feet

e. Storage (acre-feet)

Service spillway pool	24 acre-feet
Recreational pool	N.A.
Flood control	24 acre-feet
Top of dam	73 acre-feet

f. Reservoir Surface (Acres)

Top of dam	11 acres
Maximum pool	11 acres
Flood control pool	7 acres
Recreational pool	N.A.
Service spillway crest	7 acres

g. Dam

Type	Earthfill
Length	660 feet
Height	16 feet
Side slopes - Upstream	Vertical
- Downstream	3 horiz. to 1 vert.
Zoning	Unknown
Impervious core	Concrete corewall (reportedly)
Grout curtain	Unknown

h. Diversion and Regulating Tunnel N.A.

i. Service Spillway

Type	Box drop inlet
Length of weir	
Concrete weir	11.6 feet
Timber stoplogs	2 feet
Crest elevation	
Concrete weir	824.3
Timber stoplogs	824.3
Gates	2-foot long stoplogs at upstream end of drop inlet

j. Auxiliary Spillway No. 1

Type	Free overflow type broad crested weir
Length of weir - Primary	9 feet
- Secondary	12 feet

Crest elevation - Primary	826.0
- Secondary	827.5
Gates	None

k. Auxiliary Spillway No. 2

Type	Grass lined trapezoidal section
Length of weir	20 feet
Crest elevation	828.5
Gates	None

1. Regulating outlets

2 feet long stoplogs in upstream end of drop inlet

SECTION 2: ENGINEERING DATA

2.1 Design

No plans or calculations pertaining to the original dam could be obtained. Reportedly, the dam was constructed prior to 1900. Information and plans for a proposed spillway modification and walkway construction are available in the NJDEP file as follows:

Plans titled "Architectural and Structural Pond Development" for County College of Morris by Eppler & Seaman dated 1971 - 1972 (3 sheets)

Calculations of runoff and discharge hydraulics for the construction mentioned above are also available in the NJDEP file.

Further information concerning drop inlet and auxiliary spillway are available on plans titled "Dalrymple Pond Outlet Structure" by County College of Morris, 1976 and "Part of Dalrymple Pond" by Herbert O. Winston Inc. of Morristown, N.J., 1972.

2.2 Construction

No records are available pertaining to the construction of either the original dam or the subsequent modifications.

2.3 Evaluation

a. Availability

Available engineering information is limited to that which is on file at the NJDEP and the County College of Morris. The NJDEP file contains copies of plans, calculations and corre-

spondence. The file is available for inspection at the office of the Bureau of Flood Plain Management, 1474 Prospect Street, Trenton, N. J. The County College of Morris file contains copies of plans and is available for inspection at the campus maintenance building.

b. Adequacy

The available information, together with field measurements, is considered to be of significant assistance in the performance of a Phase I evaluation. A list of absent information is included in paragraph 7.1.b.

c. Validity

Most of the information that could be verified was found to be valid within a reasonable allowance for error. Some information found on the Eppler & Seaman plans pertaining to Auxiliary Spillway No. 1 did not correspond to data collected at the time of inspection.

SECTION 3: VISUAL INSPECTION

3.1 Findings

a. General

The inspection of Dalrymple Pond Dam took place on April 30, 1979 by members of the staff of Storch Engineers. A copy of the visual inspection check list is contained in Appendix 1. The following procedures were employed for the inspection:

1. The embankment of the dam, appurtenant structures and adjacent areas were examined.
2. Areas of suspected seepage were noted and located.
3. The embankment and appurtenant structures were measured and key elevations determined by a surveyor's level.
4. The embankment and appurtenant structures and adjacent areas were photographed.

b. Dam

Cracks were observed in the concrete cap on the stone masonry wall that forms a portion of the upstream face of dam. The stone rubble wall that forms the remainder of the upstream face of dam appeared to be in fair condition. The embankment is generally grass covered with some bare areas and trees and brush on the downstream face. Significant erosion was noted on the side slopes of the discharge channel for Auxiliary Spillway No. 1. Significant seepage, discharging as a trickle, was observed at the toe of dam adjacent to the spillway discharge pipe. It appeared that the seepage path is along the pipe.

Seepage, with orange deposits present, was observed at the toe of dam in the discharge channel for Auxiliary Spillway No. 1 and at a point several feet west of the discharge channel.

Along the east bank of the pond an exposed, deteriorated concrete corewall was observed. This appeared to be the corewall for that portion of the original dam that was eliminated by fill.

The embankment was generally free of settlement with one area of slight settlement in the crest located above the discharge pipe for the drop inlet spillway. The embankment appeared to be free of cracks or animal burrows.

c. Appurtenant Structures

Drop Inlet Spillway

The drop inlet and its discharge pipe appeared to be in good condition. The steel grate spanning the drop inlet is dented but appeared to be structurally sound at the time of inspection. The timber stoplogs which are used as controlled crest and outlet works appeared to be in satisfactory condition.

Auxiliary Spillway No. 1

The walkway, composed of timber on steel beams, appeared to be in satisfactory condition. The concrete weir contains a rough, crudely cut notch that serves as primary crest. The concrete surface of the downstream face of the weir is deteriorated and soil has accumulated on the secondary crest.

Auxiliary Spillway No. 2

The crest and sides of the spillway are grass covered and are in generally adequate condition with some erosion and wearing due to pedestrian traffic.

d. Reservoir Area

Dalrymple Pond Dam is approximately round in shape, with a width of approximately 700 feet. Shore slopes range from 3 to 10 percent with an average slope of 5 percent. A section of the east shore, 263 feet in length, is approximately 1 foot lower than the crest of dam, thus forming an area of discharge along the east bank of the pond. Discharge over this bank would flow over an area of fill, and then into Mill Brook downstream from the dam.

e. Downstream Channel

The downstream channel of Dalrymple Pond Dam is a stream which carries flow from a watershed outside that of Dalrymple Pond in addition to the flow from the pond. The additional flow enters through the diversion stream which encircles one side of the pond. The downstream channel is a well defined stream with a rock lined bed and no major obstructions.

SECTION 4: OPERATIONAL PROCEDURES

4.1 Procedures

The level of water in Dalrymple Pond is regulated naturally by discharge over the weir of the drop inlet spillway. This spillway also functions as outlet works when the stoplogs are removed. Reportedly, the stoplogs are sometimes removed during intense storms to augment the capacity of the spillways. In addition to the removal of stoplogs from the drop inlet, the stoplog gate of the diversion dike upstream of the lake is sometimes closed during intense storms to divert runoff around the lake.

4.2 Maintenance of the Dam

The dam is maintained by the Maintenance Department of County College of Morris which performs no regularly scheduled maintenance. The most recent maintenance was performed in 1978 and consisted of some repairs to the stone rubble wall at the northern section of the embankment.

4.3 Maintenance of Operating Facilities

Maintenance of the drop inlet spillway is performed on an "as needed" basis.

4.4 Description of Warning System

There is no warning system in effect at the present time.

4.5 Evaluation of Operational Adequacy

The operation of the dam has been successful to the extent that the dam has not been overtopped since the drop inlet spillway was constructed in 1977.

The adequacy of the maintenance program for the dam appears to be fair. The following areas of maintenance are inadequate:

1. Deteriorated condition of Auxiliary spillway No. 1 not corrected.
2. Erosion on the side slopes of the discharge channel for Auxiliary Spillway No. 1 not properly filled.
3. Trees and brush allowed to grow on downstream side of embankment.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design Data

The quantity of storm water runoff that the spillway should be able to pass without an overtopping of the dam is based on the size and hazard classification of the dam. This runoff, called the spillway design flood (SDF), is described in terms of frequency or probable maximum flood (PMF) depending on the extent of the dam's size and potential hazard. According to the "Recommended Guidelines for Safety Inspection of Dams", published by the U.S. Army Corps of Engineers, the SDF for Dalrymple Pond Dam falls in a range of 100-year to 1/2 PMF. In this case, the low end of the range, 100-year, is chosen since the factors used to select size and hazard classification are on the low side of their respective ranges.

The SDF peak inflow for Dalrymple Pond is 334 c.f.s. as calculated by the Rational Method. Hydrologic computations are contained in Appendix 4.

Discharge capacities for Dalrymple Pond were computed by considering four points of outflow from the lake: 1) drop inlet spillway, 2) Auxiliary Spillway No. 1, 3) Auxiliary Spillway No. 2, and 4) the low area along the northern perimeter of the lake. The spillways were assumed to have discharge characteristics corresponding to their respective configurations. The combined discharge of the three spillways with water level at the dam crest was computed to be 341 c.f.s. Since this value is greater than the SDF peak inflow, the spillways are assessed as being adequate in accordance with criteria developed by the U.S. Army Corps of Engineers.

The low area along the eastern perimeter of the lake was assumed to be a broad crested weir with $c=2.6$. Discharge over the low area with water level at the dam crest was computed to be 830 c.f.s. Therefore, the total discharge from the lake with water level equal to the dam crest is 1171 c.f.s.

b. Experience Data

Reportedly, Dalrymple Pond Dam has not experienced overtopping since the construction of the primary spillway in 1977.

c. Visual Observation

At the time of the field inspection there was no evidence of past overtopping. Erosion observed on the side slopes of the downstream channel for Auxiliary Spillway No. 1 did not appear to be the result of overtopping of the dam.

d. Overtopping Potential

Computations outlined in Appendix 4 indicate that the dam would not be overtopped during storms equivalent to the designated SDF.

SECTION 6: STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual observations

The embankment appeared to be outwardly structurally stable at the time of inspection with no evidence of major cracks or displacement. However, three zones of seepage were observed along the downstream toe of dam. An accurate determination of the severity of the seepage cannot be made without further investigation beyond the scope of a Phase I inspection.

b. Design and Construction Data

Analysis of structural stability and construction data for the embankment are not available. Structural details of the drop inlet, however, are available on plans by County College of Morris dated 1976 (See Section 2.1).

c. Operating Records

No operating records are available for the dam. The water level of Dalrymple Pond is not monitored.

d. Post Construction Changes

Subsequent to the original construction of the dam, the following changes have taken place:

1. Construction of walkway and modification of concrete weir crest in 1971-1972. Lake level was raised from 823.5 to 826.0 feet to increase storage.

2. Area immediately downstream from the eastern section of the original embankment was filled in preparation for a proposed parking area.
3. In 1977, the drop inlet now acting as service spillway was reportedly constructed. Reportedly, a section of the embankment was excavated and a hole was cut through the core wall to allow placing of the 18" RCP discharge culvert. Signs of backfilling can be detected as a slight depression on the dam crest above the pipe. With the installation of the drop inlet, the lake level was lowered from 826.0 to 824.3.

e. Seismic Stability

Dalrymple Pond Dam is located in Seismic Zone 1 as defined in "Recommended Guidelines for Safety Inspection of Dam" which is a zone of very low seismic activity. Experience indicates that dams in Seismic Zone 1 will have adequate stability under seismic loading conditions if stable under static loading conditions. Dalrymple Pond Dam appeared to be outwardly stable under static loading conditions at the time of inspection.

SECTION 7: ASSESSMENT AND RECOMMENDATION

7.1 Dam Assessment

a. Safety

Based on hydraulic and hydrologic analyses outlined in Section 5 and Appendix 4, the spillway of Dalrymple Pond Dam is assessed as being adequate.

The dam appeared, at the time of inspection, to be outwardly structurally stable. The seepage is not considered to be an immediate indication of instability. No reported nor written evidence was found that would contradict this assessment.

b. Adequacy of Information

Information was gathered from several sources, including: 1) Field investigation, 2) USGS quadrangle sheet, 3) aerial photograph from Morris County, 4) consultation with staff member of County College of Morris and 5) plans prepared by Eppele and Seaman and plans prepared by County College of Morris.

The information obtained is sufficient to allow a Phase I assessment as outlined in "Recommended Guidelines for Safety Inspection of Dams."

Some of the absent data are as follows:

1. Hydraulic and structural analyses of the dam and appurtenances with drop inlet spillway in place.
2. Original dam design data.

3. Stream and lake elevation gaging records.
4. Plans and sections of dam embankment.
5. Description of the dam fill materials.
6. Inspection reports.

c. **Necessity for Additional Data/Evaluation**

Additional evaluation is necessary to assess the effect of the observed seepage on the structural integrity of the dam. The evaluation should be based on monitoring of seepage as outlined in paragraph 7.2.c.

7.2 Recommendations

a. **Remedial Measures**

Hydraulic and hydrologic analyses indicate that the spillways, together with a low area in the bank of Dalrymple Pond, are adequate to pass a 100-year flood without an overtopping of the dam.

However, the low area in the pond bank should not be allowed to serve as an area of discharge from the pond since it is not adequately protected against erosion. Therefore, remedial measures should be taken in the future to prevent discharge over the banks of the pond.

It is further recommended that the following measures be undertaken by the owner in the near future.

1. Auxiliary Spillway No. 1 should be thoroughly renovated by patching, grouting and coating with an epoxy sealant.

2. The junction between the dam and the discharge channel for Auxiliary Spillway No. 1 should be protected from erosion by the construction of training walls.
3. Because it is not properly protected against erosion Auxiliary Spillway No. 2 should be eliminated by filling the embankment to provide a level dam crest in that area. The embankment should be properly stabilized after being filled.
4. The area of settlement in the dam crest above the spillway discharge pipe should be properly filled and stabilized.
5. Trees and brush which are present on the embankment should be removed.

b. Maintenance

The owner of the dam should initiate, in the near future, a program of periodic inspection and maintenance, the complete records of which to be kept on file and made available to the public. A visual inspection of the dam and appurtenances by a professional engineer experienced in the design and construction of dams should be made annually and reported on a standardized check-list form. Repairs should be made as required and the following maintenance should be performed annually: remove adverse vegetation from the embankment, fill and sod any eroded surfaces of the embankment and clear the downstream channel. In addition, the lake should be lowered at least once every five years at which time the lake should be cleaned and the normally submerged portions of the dam and spillway inspected and repaired.

c. Additional Studies

Arrangements should be made in the near future to monitor the seepage by visual observation. If necessary, measurements should be made by the use of appropriate instrumentation. The monitoring should be performed by a professional engineer experienced in the design and construction of dams and included in the permanent records mentioned in paragraph 7.2.b.

A detailed topographic survey of the dam and the area around the dam should be undertaken in the near future by a qualified licensed land surveyor or professional engineer. The survey should be related to existing construction drawings and should become part of the permanent records of the dam.

PLATES

DALRYMPLE POND DAM

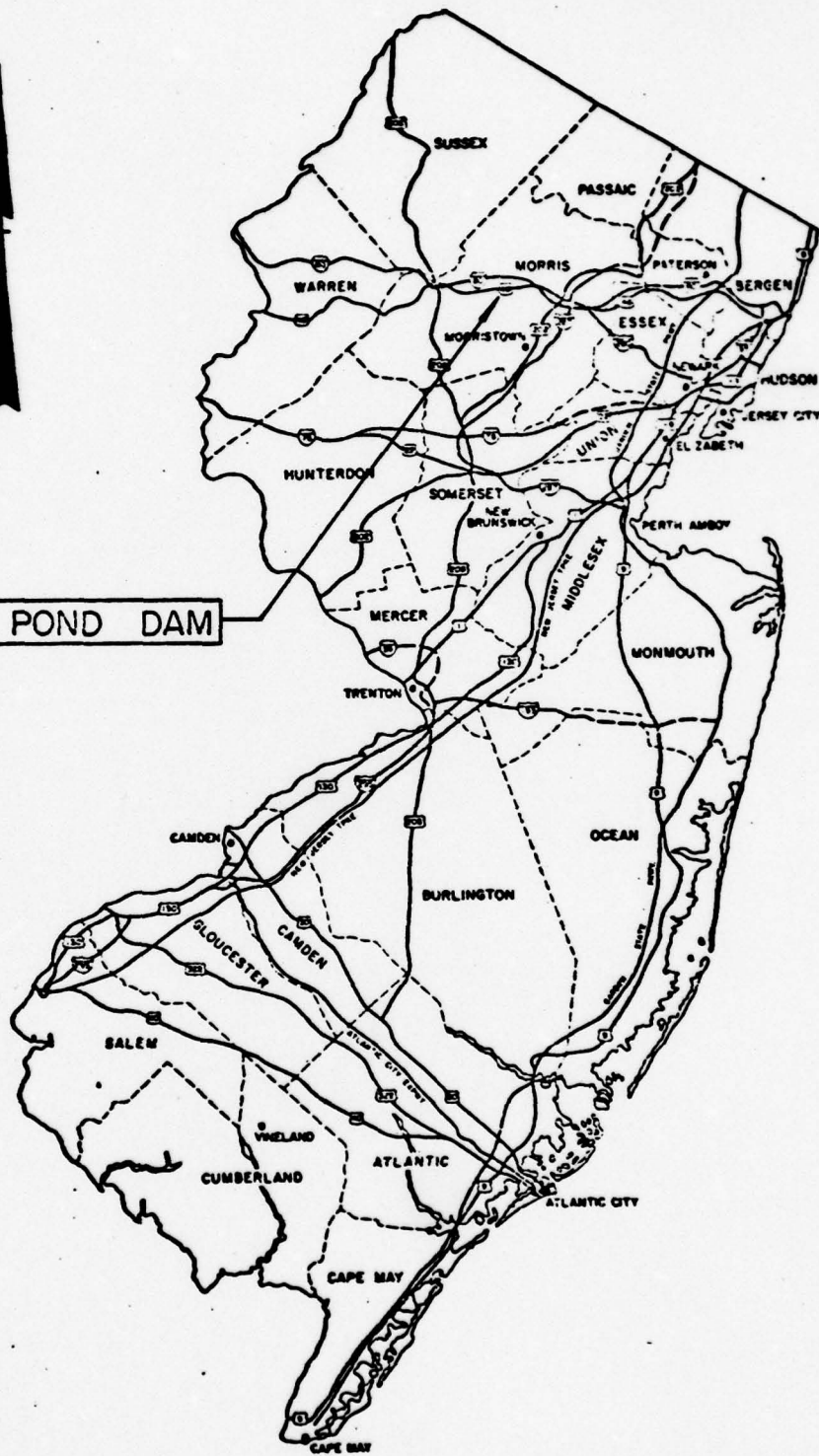


PLATE I

STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS

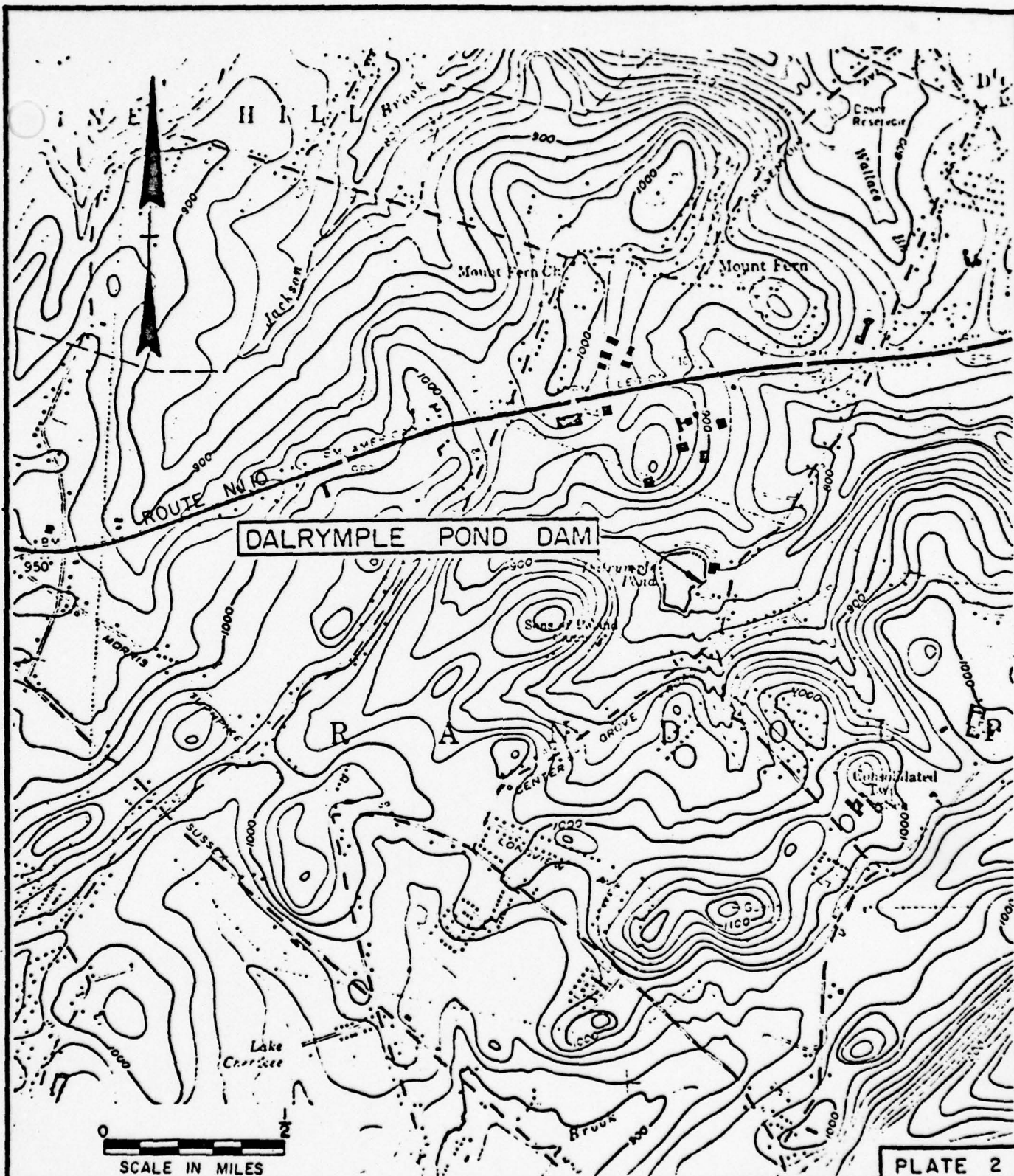
KEY MAP

DALRYMPLE POND DAM

I.D. N.J. 00350

SCALE: NONE

DATE: JUNE, 1979



STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

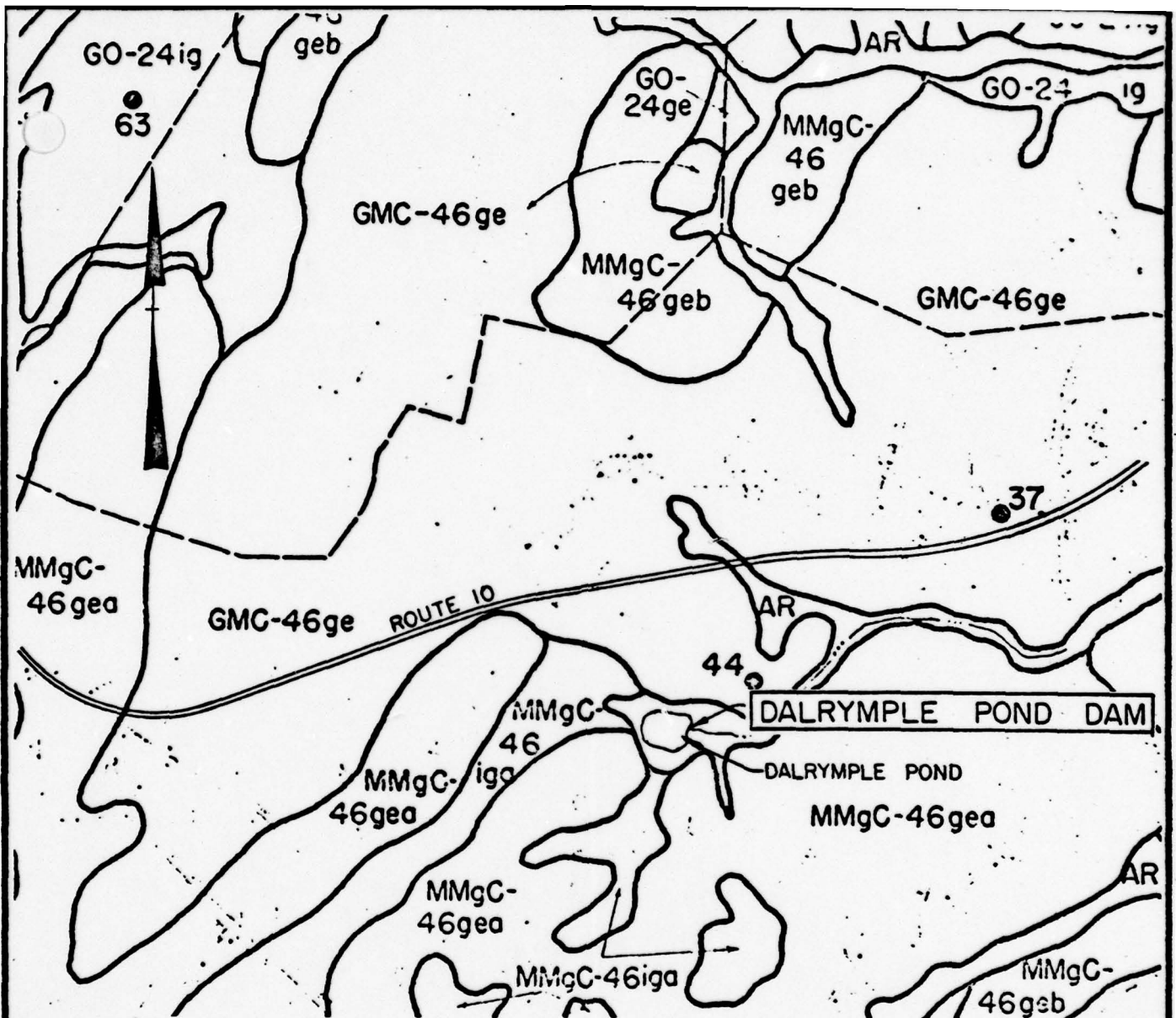
DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS
VICINITY MAP
DALRYMPLE POND DAM

I.D. NJ 00350

SCALE: AS SHOWN

DATE: JUNE, 1979



Legend

AR Recent alluvium composed of stratified materials deposited by streams.

MMgC-46 Residual soil weathered to comparatively great depths, overlying gneissic bedrock.

Note: Information taken from Rutgers University Soil Survey of New Jersey, Report No. 9, Morris County, Geologic Map of New Jersey prepared by Lewis and Kummel.

PLATE 3

STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS SOIL MAP

DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

DALRYMPLE POND DAM

I.D. NJ00350

SCALE: NONE

DATE: JUNE 1979

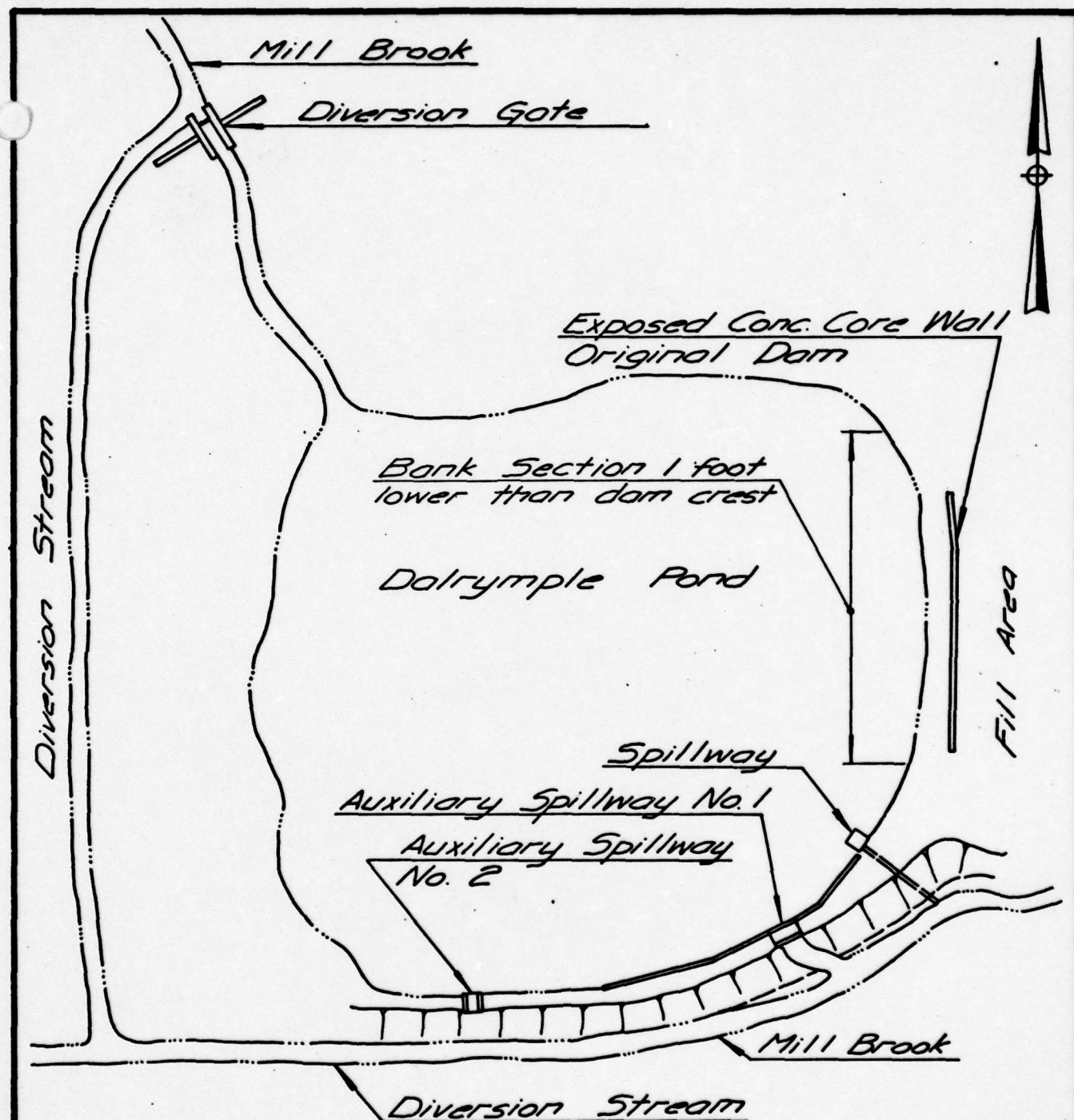


PLATE 4

STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS
OVERVIEW PLAN
DALRYMPLE POND DAM

I.D. N.J. 00350

SCALE: NOT TO SCALE

DATE: JUNE, 1979

Dalrymple Pond

Overall Dam Length = 659'

Auxiliary Spillway No. 2
Crest Elev. 828.5

Crest of Dam

Stone Masonry
Wall

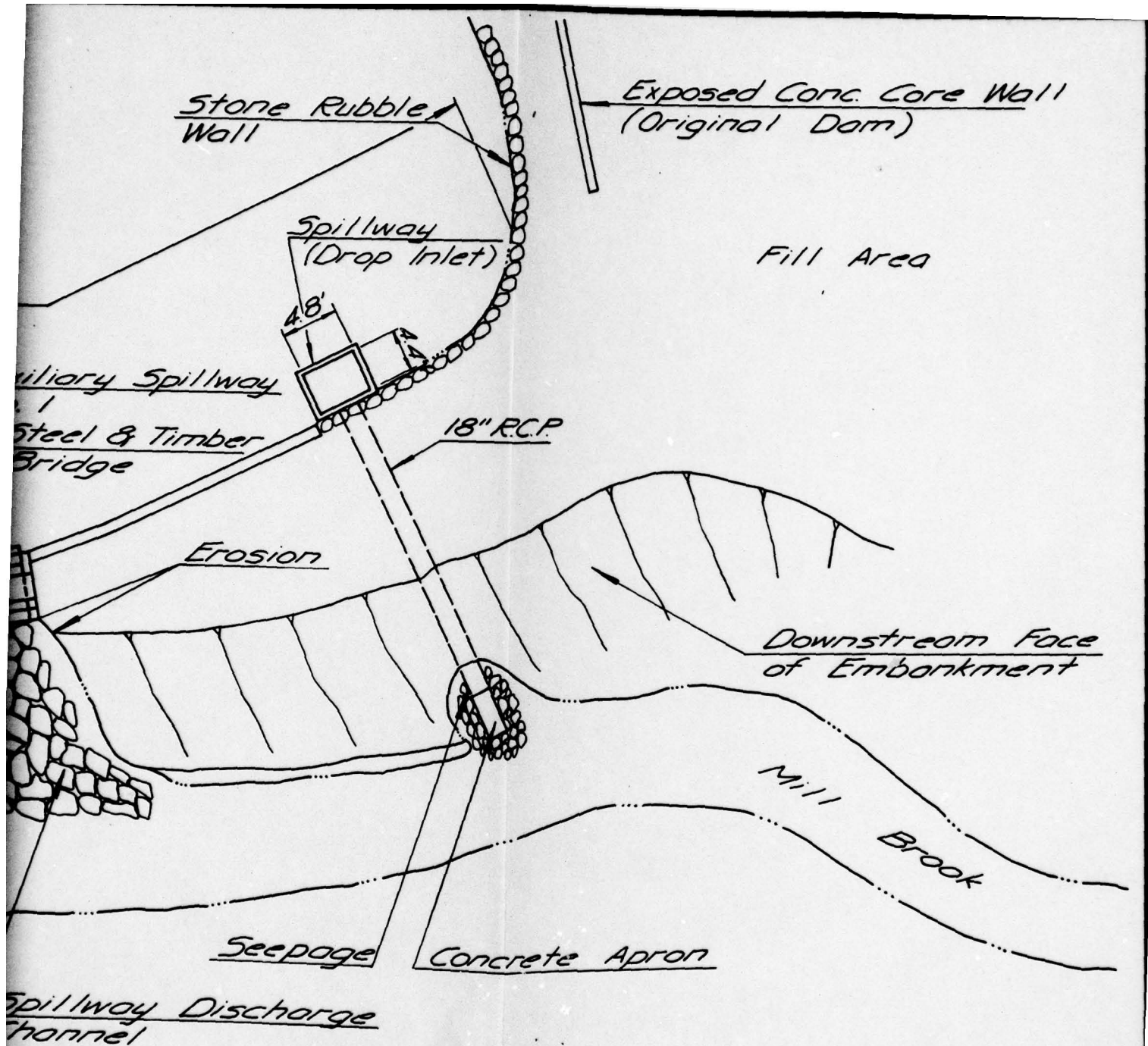
Auxiliary
No. 1
Steel &
Bridge

20'

Diversion Stream

Spillway
Channel

Note: Information
prepared by
dated April
inspection



Information taken from plans
 and by Eppler & Seaman's
 April 1972 and field
 visit April 30, 1979.

PLATE 5

STORCH ENGINEERS
 FLORHAM PARK, NEW JERSEY

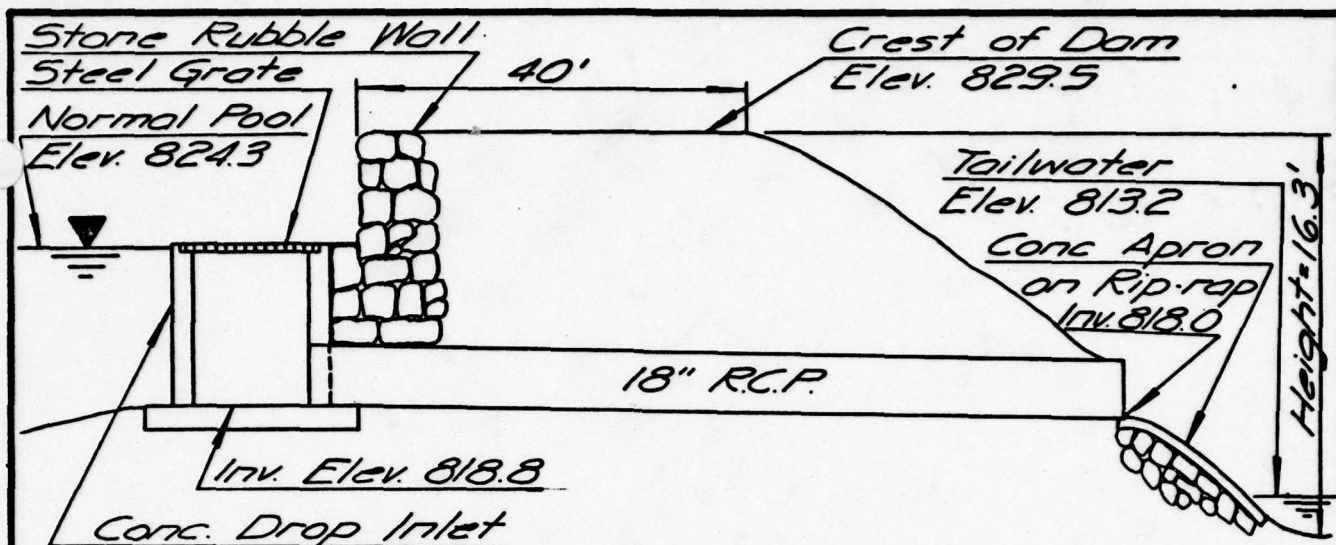
DIVISION OF WATER RESOURCES
 N.J. DEPT. OF ENVIR. PROTECTION
 TRENTON, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS
 GENERAL PLAN
 DALRYMPLE POND DAM

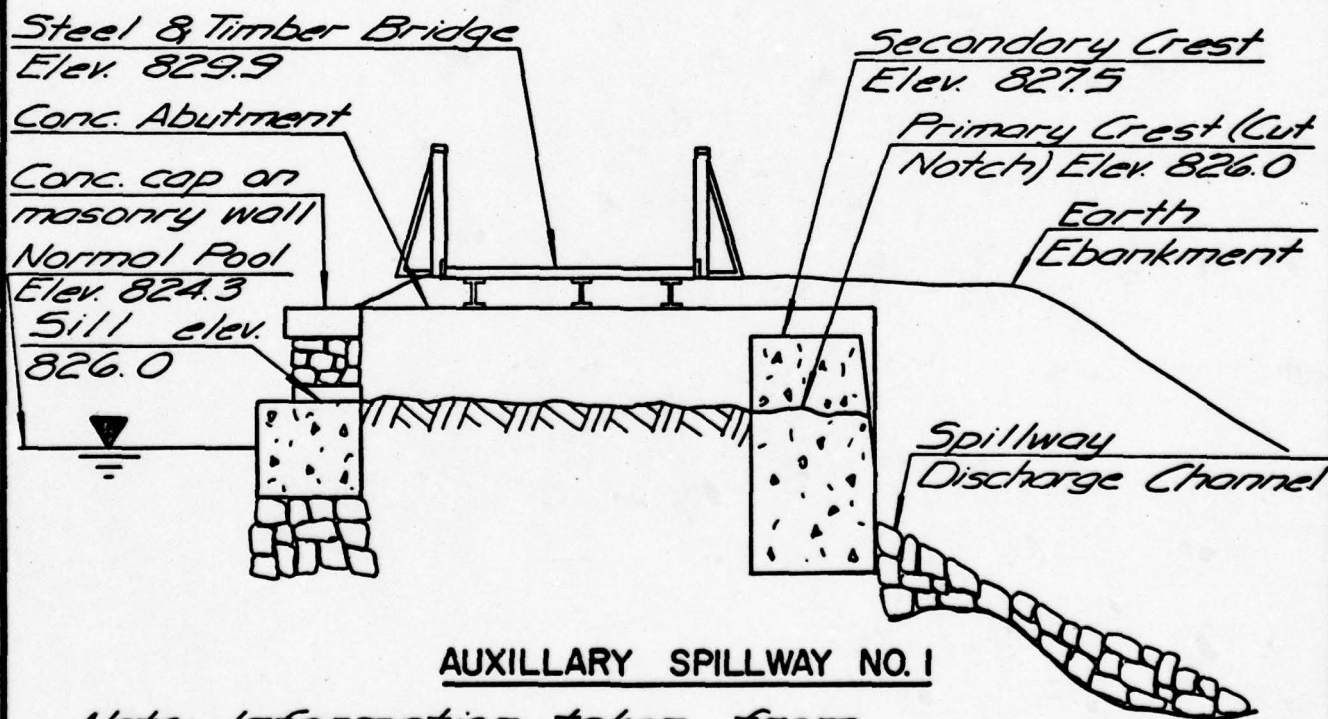
I.D. N.J. 00350

SCALE: NOT TO SCALE

DATE: JUNE, 1979



DROP INLET SPILLWAY



AUXILLARY SPILLWAY NO. 1

*Note: Information taken from
plans prepared by Eppler &
Seamans dated April 1972 and
field inspection April 30, 1979.*

PLATE 6

STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

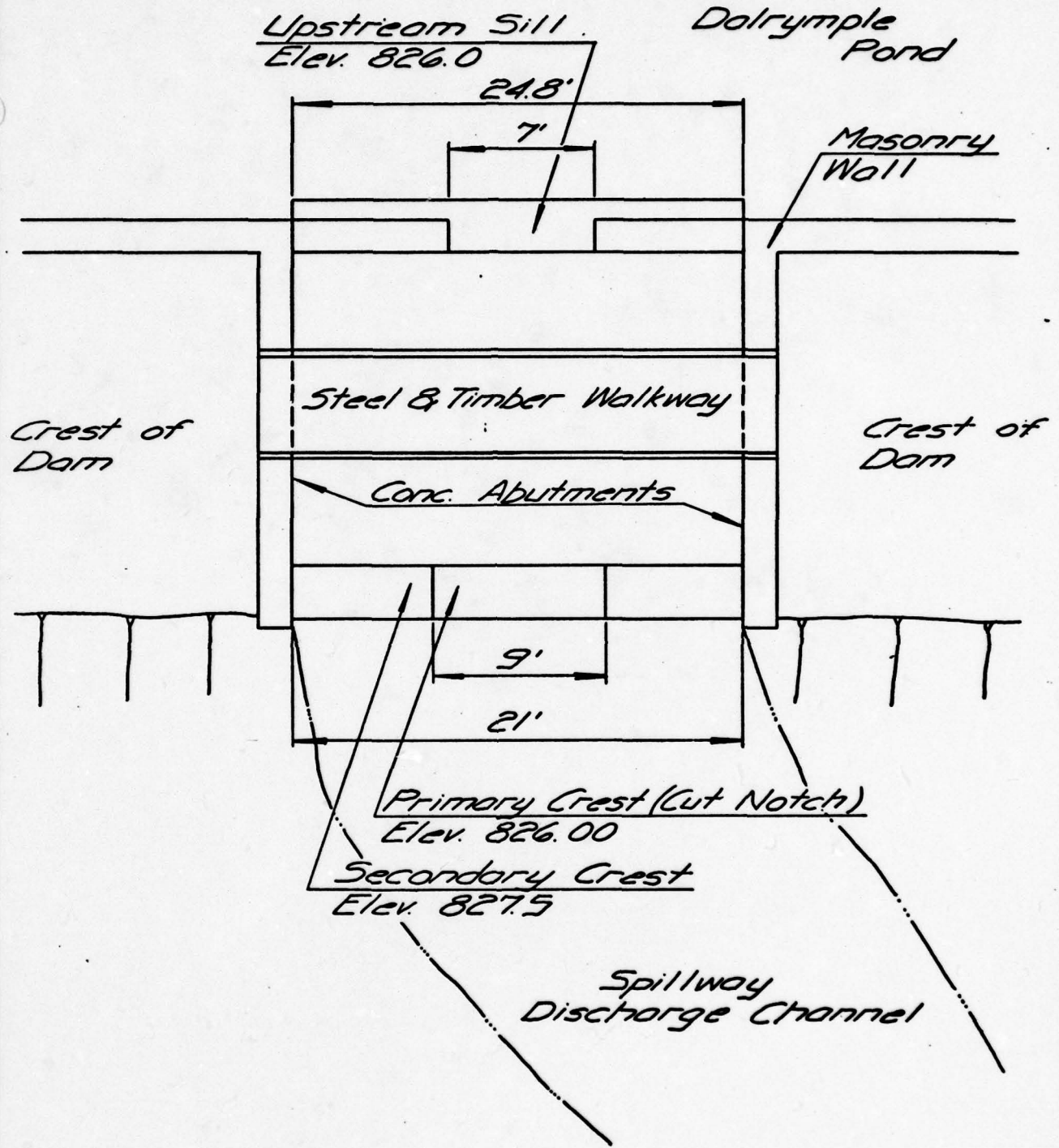
DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS
SPILLWAY SECTIONS
DALRYMPLE POND DAM

I.D. N.J. 00350

SCALE: NOT TO SCALE

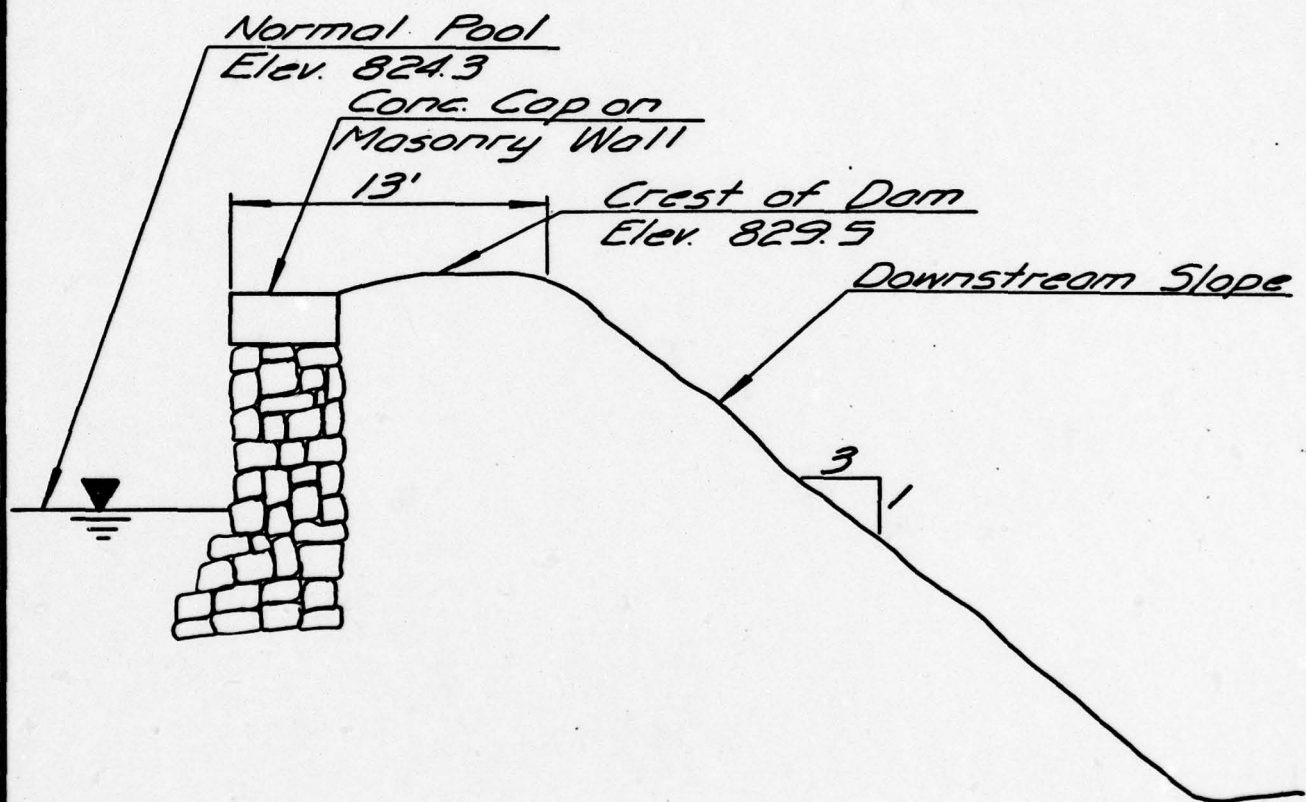
DATE: JUNE, 1979



Note: Information taken from field inspection dated April 30, 1979.

PLATE 7

<p>STORCH ENGINEERS FLORHAM PARK, NEW JERSEY</p>	<p>INSPECTION AND EVALUATION OF DAMS PLAN - AUXILIARY SPILLWAY NO. 1 DALRYMPLE POND DAM</p>	
<p>DIVISION OF WATER RESOURCES N.J. DEPT. OF ENVIR. PROTECTION TRENTON, NEW JERSEY</p>	<p>I.D. N.J. 00350</p>	<p>SCALE: NOT TO SCALE</p>
		<p>DATE: JUNE, 1979</p>



*Note: Information taken from
field inspection dated April 30, 1979.*

PLATE 8

STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

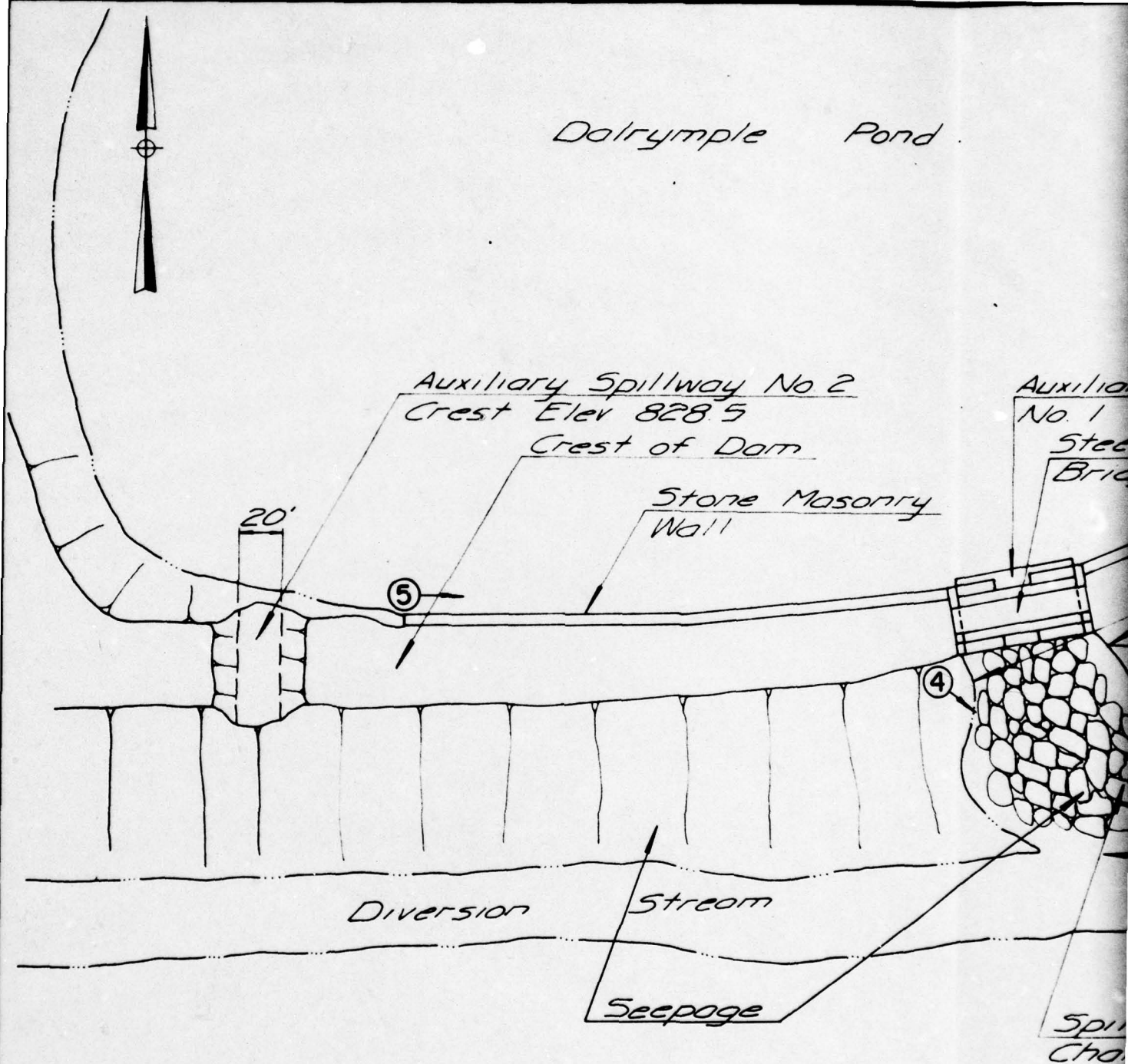
INSPECTION AND EVALUATION OF DAMS
TYPICAL DAM SECTION
DALRYMPLE POND DAM

I.D. N.J. 00350

SCALE: NOT TO SCALE

DATE: JUNE, 1979

Dalrymple Pond



Note: Information prepared dated April inspection

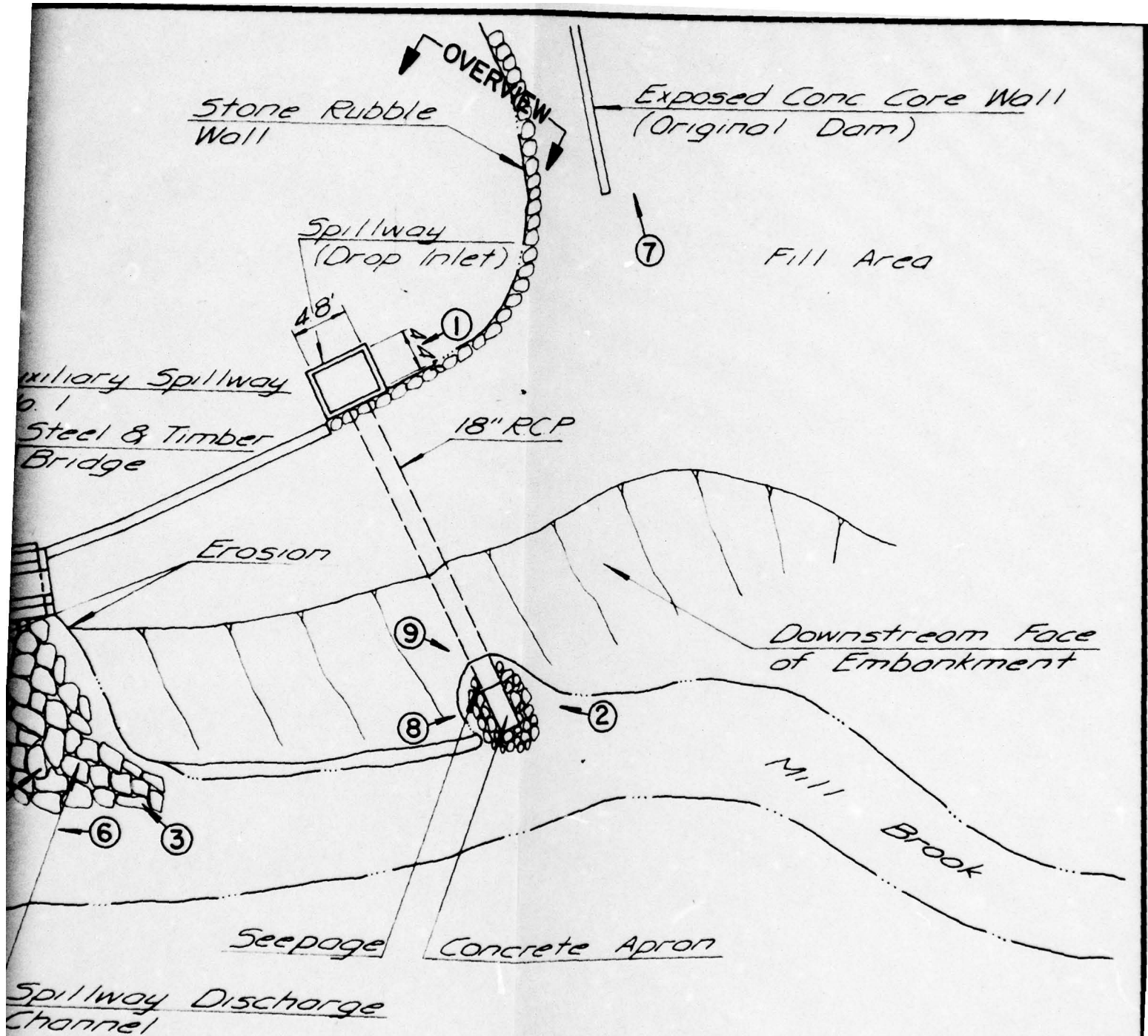


PLATE 9

STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS
PHOTO LOCATION PLAN
DALRYMPLE POND DAM

I.D. N.J. 00350

SCALE: NOT TO SCALE

DATE: JUNE, 1979

Information taken from plans
prepared by Eppler & Seamans
April 1972 and field
inspection April 30, 1979

APPENDIX 1

Check List - Visual Inspection

Check List - Engineering Data

Check List
Visual Inspection
Phase I

Name of Dam Dalrymple Pond County Morris State New Jersey Coordinators NJDEP

Date(s) Inspection 4/30/79 Weather Fair Temperature 75°F

Pool Elevation at Time of Inspection 824.3 M.S.L. Tailwater at Time of Inspection 813.2 M.S.L.

Inspection Personnel:

John Gribbin David Hoyt

Ronald Lai Joseph Fox

Richard McDermott

John Gribbin Recorder

Present: John Cockley, Director of Plant Maintenance
County College of Morris

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
GENERAL	N.A.	
STRUCTURE TO ADJUTMENT/EMBANKMENT FUNCTIONS	N.A.	
DAMAINS	N.A.	
WATER PASSAGES	N.A.	
FOUNDATION	N.A.	
VERTICAL AND HORIZONTAL ALIGNMENT	N.A.	

CONCRETE/MASONRY DAMS

GENERAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
FACE CRACKS CONCRETE SURFACES	N.A.	
STRUCTURAL CRACKING	N.A.	
CONSTRUCTION JOINTS	N.A.	
JOINT JOINTS	N.A.	
SEALAGE	N.A.	
REPAIRS	N.A.	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
GENERAL	<p>Stone masonry wall in satisfactory condition. Conc. cap contains some cracks.</p> <p>Stone rubble wall in fair condition.</p> <p>Embankment generally grass covered with some bare areas and brush and small trees on the downstream slope.</p>	<p>Upstream face comprised of stone masonry wall and stone rubble wall.</p> <p>Evidence of recent repairs to stone rubble wall.</p>
SECTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	<p>Significant erosion in embankment along discharge channel for Auxiliary Spillway No. 1.</p>	<p>Auxiliary Spillway No. 1 formerly served as the only spillway.</p>
ANY NOTICEABLE SEEPAGE	<ol style="list-style-type: none"> 1. Seepage observed at toe of embankment adjacent to spillway discharge pipe. Seepage discharging as a trickle. 2. Seepage discharging as a trickle observed at toe of embankment west of Auxiliary Spillway No. 1. 3. Wet areas due to seepage observed in discharge channel for Auxiliary Spillway No. 1 	<p>Seepage appears to be travelling along pipe.</p> <p>Orange deposits observed at seepage zones 2 and 3.</p>
STAFF GAGE AND RECORDER	<p>None</p>	
RAINS	<p>None</p>	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
FACE CRACKS	None	
USUAL MOVEMENT OR SLIDING AT OR BEYOND TOE	None	
SLUGHING OR EROSION OF EMBANKMENT AND ABUTMENT PILES	Downstream slope near discharge pipe eroded by rain and pedestrian action. Settlement observed in embankment crest directly above spillway discharge pipe.	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	Horiz. - slightly curved Vert. - crest approx. level Surface of downstream slope irregular.	
SLURP FAILURES	None	Upstream face of embankment protected by stone masonry wall and stone rubble wall.

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SURFACES IN OUTLET CONDUIT	Appeared to be in satisfactory condition.	Outlet works outflow conduit same as spillway discharge pipe.
INTAKE STRUCTURE	Submerged portions of downstream face of stoplogs that could be observed appeared to be in satisfactory condition.	Intake structure consists of stoplogs at upstream end of drop inlet spillway.
OUTLET STRUCTURE	Submerged	Same as intake structure.
OUTLET CHANNEL		Outlet pipe discharges over concrete apron directly into downstream channel.
GATE AND GATE HOUSING	Gate system consists of stoplogs mentioned above.	

DROP INLET SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Weir formed by sides of drop inlet and by top of stoplogs appears to be in good condition.	Steel grate spanning drop inlet appears to be structurally adequate but is damaged - indented approx. 2 inches.
APPROACH CHANNEL	N.A.	
DISCHARGE CHANNEL	Same as outlet works.	
BRIDGE AND PIERS	N.A.	
EQUIPMENT AND OPERATING	Stoplogs - same as outlet works.	

DROP INLET SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Weir formed by sides of drop inlet and by top of stoplogs appears to be in good condition.	Steel grate spanning drop inlet appears to be structurally adequate but is damaged - indented approx. 2 inches.
APPROACH CHANNEL	N.A.	
DISCHARGE CHANNEL	Same as outlet works.	
BRIDGE AND PIERS	N.A.	
EQUIPMENT AND OPERATING	Stoplogs - same as outlet works.	

AUXILIARY SPILLWAY NO. 1

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Crude rectangular notch cut in weir forms primary crest. Surface very rough. Remaining portion of weir is secondary crest. Soil accumulated on secondary crest. Downstream surface of weir deteriorated. No structural cracks observed.	Spillway consists of concrete sill (upstream) and concrete weir (downstream) parallel and separated by earth surface. (This structure formerly served as the only spillway)
APPROACH CHANNEL	Sill and abutments generally in satisfactory condition with some spalling.	Approach channel composed of section between sill and weir. Bottom formed by earth; sides formed by concrete abutments.
DISCHARGE CHANNEL	Bottom of channel lined with rocks and boulders. Sides of channel are unprotected and eroded.	Channel is cut into downstream side of embankment.
BRIDGE AND PIERS	Steel and timber walkway is in satisfactory condition.	
EQUIPMENT AND OPERATING	None	

AUXILIARY SPILLWAY NO. 2

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SPILLWAY CREST	Crest and sides are grass covered and in generally adequate condition with some erosion and wearing due to pedestrian action.	Spillway consists of trapezoidal channel 1 foot deep in crest of embankment near west end. Bottom of channel is crest of spillway.
APPROACH CHANNEL	None	
DISCHARGE CHANNEL	Discharge from the spillway flows over the downstream slope of dam and into the diversion stream of Mill Brook.	
EDGE AND PIERS	None	
GATES AND OPERATING EQUIPMENT	None	

INSTRUMENTATION

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
DOCUMENTATION/SURVEYS	None	
OBSERVATION WELLS	None	
METERS	None	
BAROMETERS	None	
OTHER	N.A.	

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Slopes range from 3% to 10% with average slope of 5%.	
SEDIMENTATION	Not Known.	
STRUCTURES ALONG BANKS	Intake pipe for irrigation system located on north-east perimeter.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION OBSTRUCTIONS, DEBRIS, ETC.)	Well defined stream with rock lined bed. No major obstructions.	
SLOPES	Gradient between dam and secondary road downstream is approx. 1.5%. Bank slopes approx. 6%.	
STRUCTURES ALONG STREAM	One home is located 150 feet from stream on downstream side of secondary road (Center Grove Rd.) approx. 400 feet downstream from dam.	

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

REMARKS

PLAN	Site plan and sections titled "Pond Development" by Epple & Seaman dated 1971.
SECTIONS	
SPILLWAY - PLAN	
SECTIONS	Primary Spillway: plans and sections titled "Dalrymple Pond Outlet Structure" by County College of Morris, 1976.
DETAILS	Auxiliary Spillway No. 1: Plans and sections by Herbert O. Winston, Sept. 1972. Auxiliary Spillway No. 2: No plans available.
OPERATING EQUIPMENT PLANS & DETAILS	None
OUTLETS - PLAN	See Primary Spillway
DETAILS	See Primary Spillway
CONSTRAINTS	
DISCHARGE RATINGS	Discharge rating for Auxiliary Spillway No. 1 available in NJDEP file.
HYDRAULIC/HYDROLOGIC DATA	Available in NJDEP file.
INFALL/RESERVOIR RECORDS	Not available.
CONSTRUCTION HISTORY	No documentation.
LOCATION MAP	Available

ITEM

REMARKS

SIGN REPORTS

Runoff calculations available in NJDEP file (Auxiliary Spillway No. 1)

TOPOLOGY REPORTS

Not available

SIGN COMPUTATIONS
HYDROLOGY & HYDRAULICS
DAM STABILITY
SEEPAGE STUDIES

Available in NJDEP file (Auxiliary Spillway No. 1)
Not available
Not available

MATERIALS INVESTIGATIONS
BORING RECORDS
LABORATORY
FIELD

Not available

POST-CONSTRUCTION SURVEYS OF DAM

Not available

ADDITIONAL SOURCES

Unknown

ITEM	REMARKS
MONITORING SYSTEMS	None
MODIFICATIONS	Spillway crest of auxiliary spillway raised in 1971. Drop inlet Spillway constructed in 1977. Downstream area of Northern Section of dam filled (exact date unknown).
HIGH POOL RECORDS	Before drop inlet was installed, dam was overtopped in 1972.
LATEST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None
REPORTS ON ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	Northern Section of dam failed in 1972 - description not available
MAINTENANCE OPERATION RECORDS	Not available

APPENDIX 2

Photographs

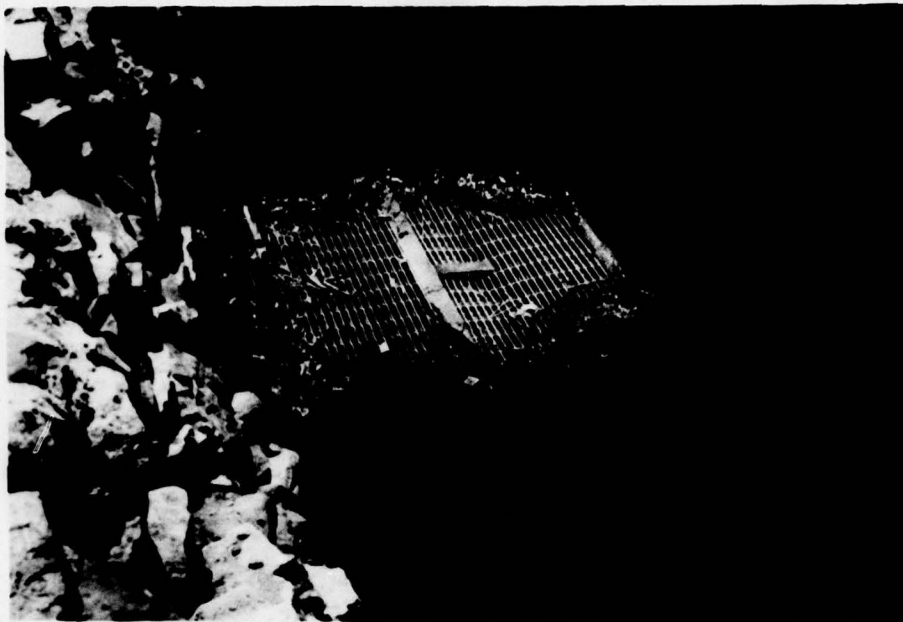


PHOTO 1
SPILLWAY



PHOTO 2
SPILLWAY DISCHARGE PIPE

DALRYMPLE POND DAM
30 APRIL 1979



PHOTO 3

AUXILIARY SPILLWAY - ORIGINALLY USED AS MAIN SPILLWAY



PHOTO 4

AUXILIARY SPILLWAY DISCHARGE CHANNEL

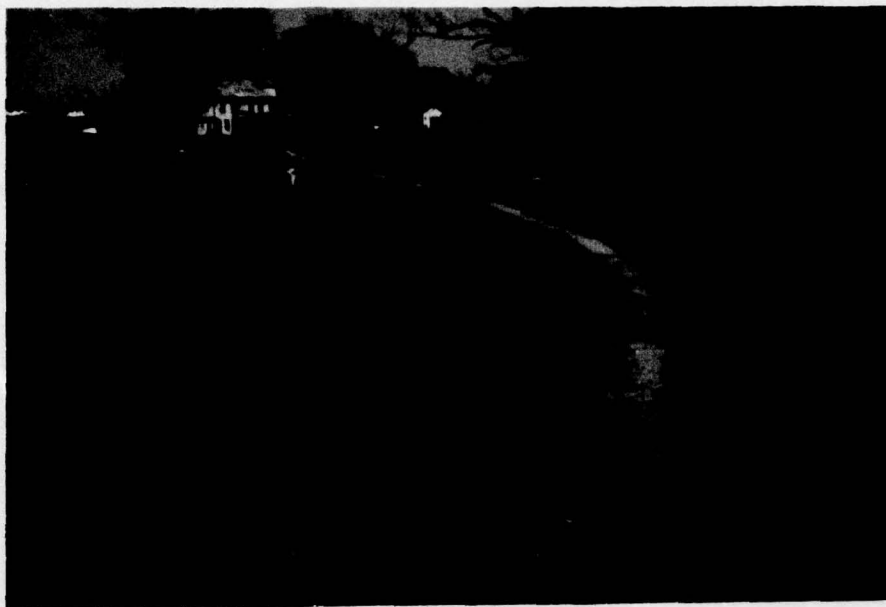


PHOTO 5
UPSTREAM FACE OF DAM



PHOTO 6
DOWNSTREAM FACE OF DAM AND
AUXILIARY SPILLWAY DISCHARGE CHANNEL

DALRYMPLE POND DAM
30 APRIL 1979

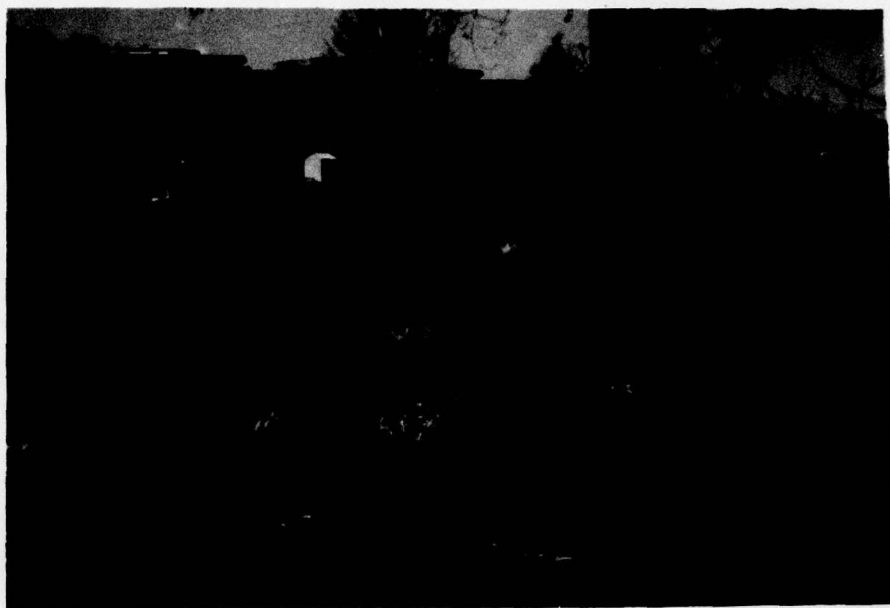


PHOTO 7

POND BANK NORTH OF DAM - ORIGINALLY PART OF DAM



PHOTO 8

SEEPAGE AT SPILLWAY DISCHARGE PIPE

DALRYMPLE POND DAM
30 APRIL 1979



PHOTO 9
DOWNSTREAM CHANNEL

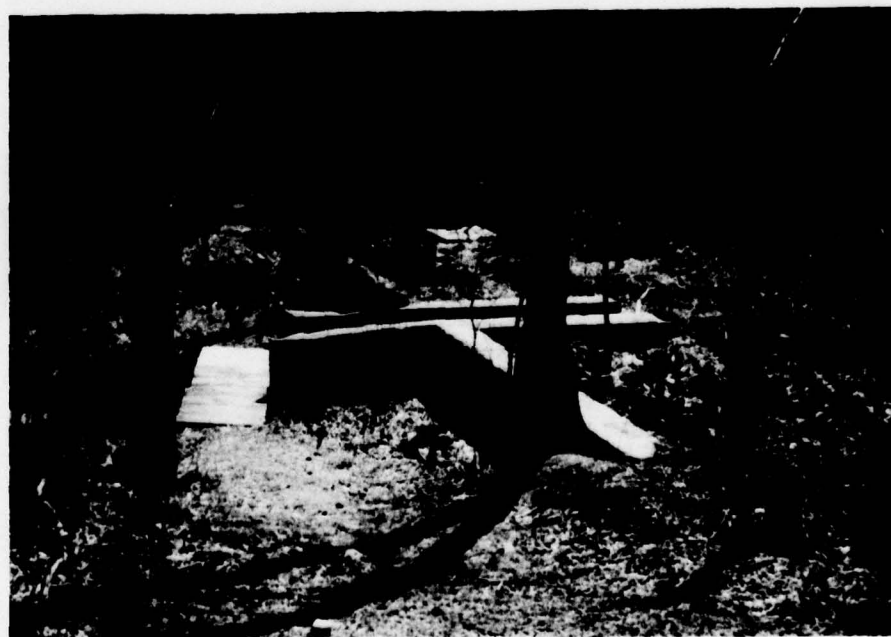


PHOTO 10
UPSTREAM DIVERSION GATE

APPENDIX 3

Engineering Data

CHECK LIST

HYDROLOGIC AND HYDRAULIC DATA

ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: Residential and wooded

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 824.3(24 Ac - ft)

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): 824.3 (24 Ac - ft)

ELEVATION MAXIMUM DESIGN POOL: 829.5

ELEVATION TOP DAM: 829.5

PRIMARY SPILLWAY CREST: Concrete weir & timber stoplogs

- a. Elevation 824.3
- b. Type uncontrolled overflow
- c. Width 6 inch to 12 inches
- d. Length Total 15.6 feet
- e. Location Spillover Box inlet at upstream side of dam
- f. Number and Type of Gates One gate - timber stoplogs 2.0 feet long

AUXILIARY SPILLWAY NO. 1: Concrete weir

- a. Elevation 826.0
- b. Type Uncontrolled overflow
- c. Width 13 feet
- d. Length Total 21 feet
- e. Location Spillover Upstream side of dam
- f. Number and Type of Gates N.A.

AUXILIARY SPILLWAY NO. 2: Embankment low area

- a. Elevation 828.5
- b. Type Uncontrolled overflow
- c. Width 13 feet
- d. Length 20 feet
- e. Location Spillover Crest of embankment
- f. Number and Type of Gates N.A.

OUTLET WORKS: 2.0 foot long slot in spillway

- a. Type Stoplog gate
- b. Location Upstream end of spillway
- c. Entrance inverts 818.8
- d. Exit inverts 817.7
- e. Emergency draindown facilities Remove stoplogs

HYDROMETEOROLOGICAL GAGES: None

- a. Type N.A.
- b. Location N.A.
- c. Records N.A.

MAXIMUM NON-DAMAGING DISCHARGE:

(Lake stage equal to top of
east bank, elev. 828.5) 150 c.f.s.

APPENDIX 4

Hydrologic Computations

STORCH ENGINEERS

Sheet 1 of 9

Project

Dairyville Pond

Made By

RL

Date

8-23-79

Chkd By

JG

Date

8-23-79Hydrology

100 year storm will be calculated by the rational method. Drainage area, A, equals 384 acres.

Time of concentration

By SCS TR-55

Length of overland flow 2,000'

Slope

3%

vel

0.6 fps

Length of stream flow 4,000'

Slope

2.6%

vel

3 fps

$$T_c = \left(\frac{2000}{0.6} + \frac{4000}{3} \right) \frac{1}{3600} = 1.296 \text{ hr.}$$

Time of concentration by Kerby
Pg 14-36 "Handbook of Applied Hydrology"

$$t_c^{2.14} = \frac{2}{3} \frac{L_n}{\sqrt{S}}$$

t_c = time of conc. in min.

L = length of overland flow in ft

S = slope

n = 0.4 roughness coef.

$$t_c^{2.14} = \frac{2}{3} \frac{2000(0.4)}{\sqrt{0.0075}} \quad t_c = 42.7 \text{ min}$$

STORCH ENGINEERS

Sheet 2 of 9

Project Dalrymple Pond Made By RL Date 8-23-79

Chkd By JG Date 8-23-79

T_c by Kerby (cont).

$$\begin{aligned} & 42.7 \text{ min} + 22 \text{ min for channel flow} \\ & = 64.7 \text{ min} \\ & = 1.1 \text{ hr.} \end{aligned}$$

use $T_c = 1.1 \text{ hr.}$

From rainfall-duration chart

$$i = 3" / \text{hr.}$$

Coefficient of Runoff (c)

Drainage basin mostly wooded with some development (college campus)

$$\text{Use } c = 0.29$$

100-year Peak Runoff (Q)

$$\begin{aligned} Q &= Aci \\ &= (384)(.29)(3) \\ &= 334 \text{ c.f.s.} \end{aligned}$$

STORCH ENGINEERS

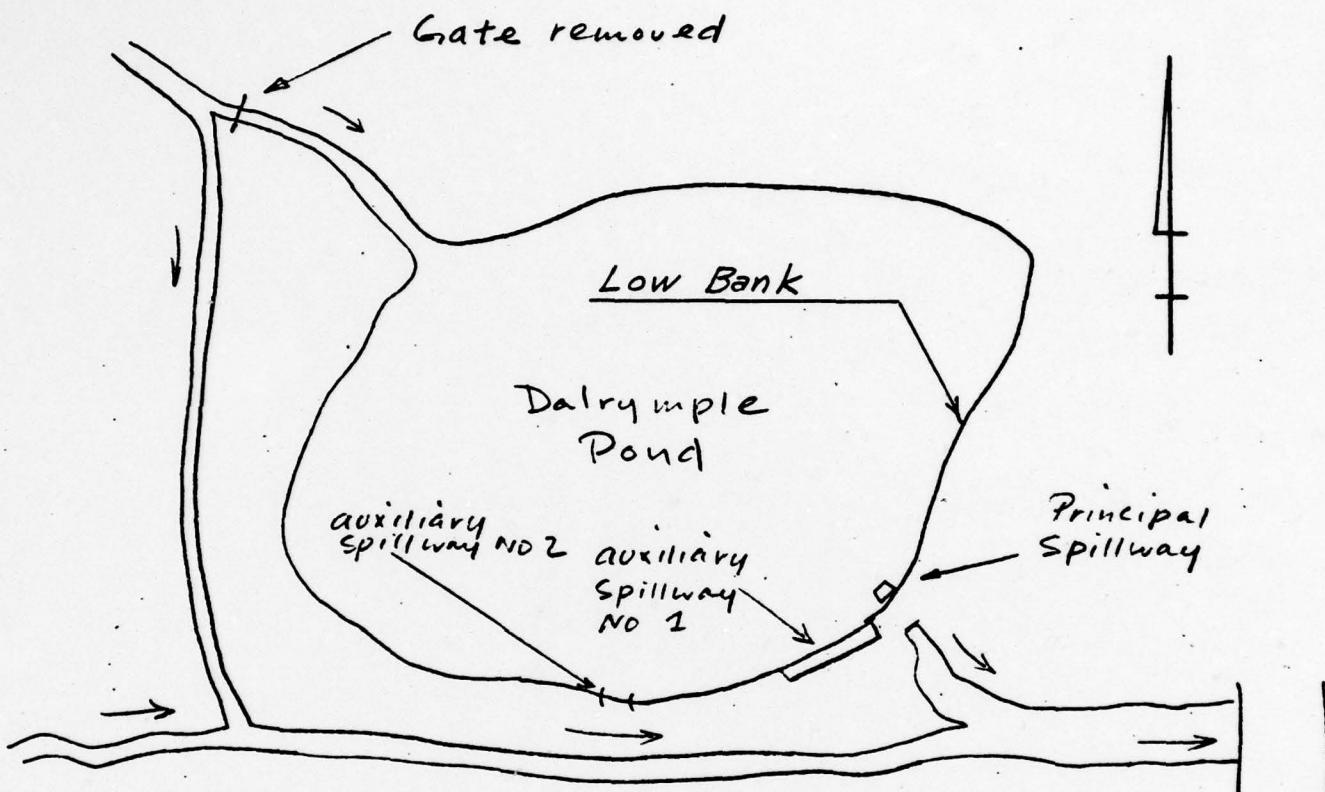
Sheet 3 of 9

Project Dalrymple Pond

Made By RL Date 5-23-79

1132 B

Chkd By DMP Date 6-25-79



Upstream of Dalrymple Pond, a diversion ditch is observed where a gate can be installed to divert flow from the pond.

For the purpose of this analysis, assume all the runoff from watershed enters the pond.

STORCH ENGINEERS

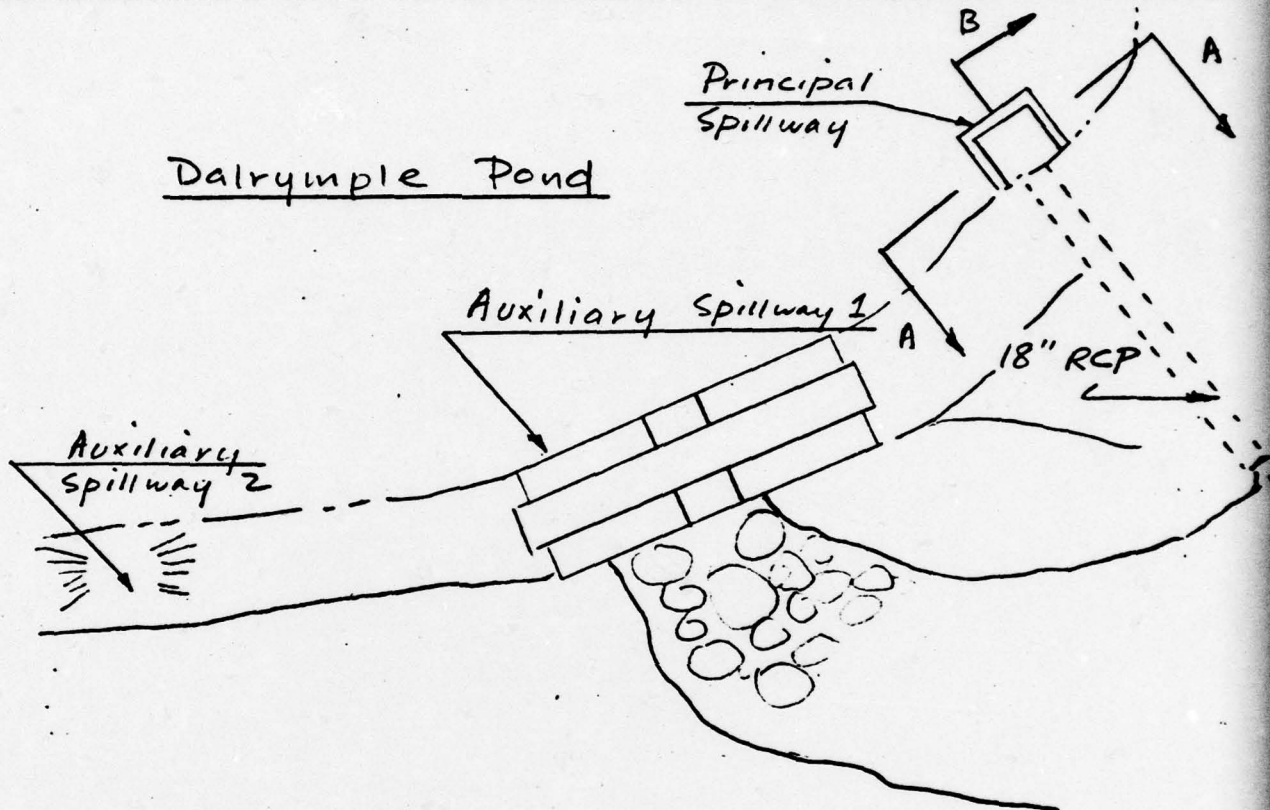
Sheet 4 of 9

Project Dalrymple Pond

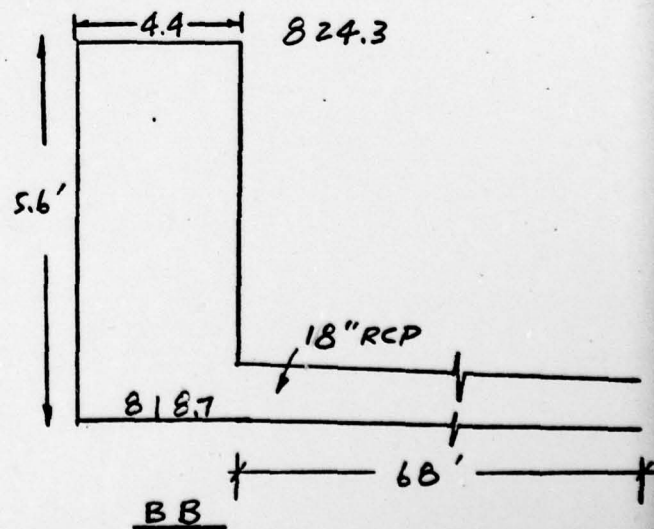
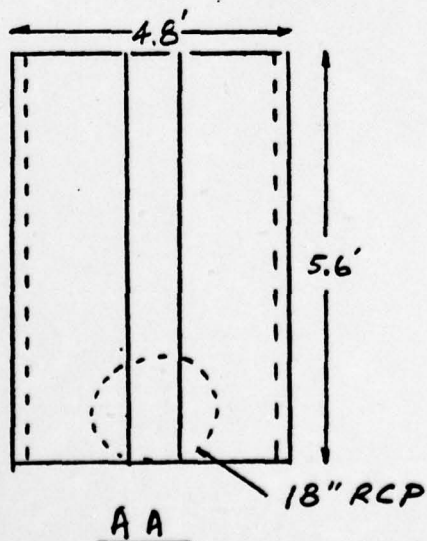
Made By RL Date 5-23-79

1132 B

Chkd By DMP Date 6-25-79



PLAN



SPILLWAY SECTIONS

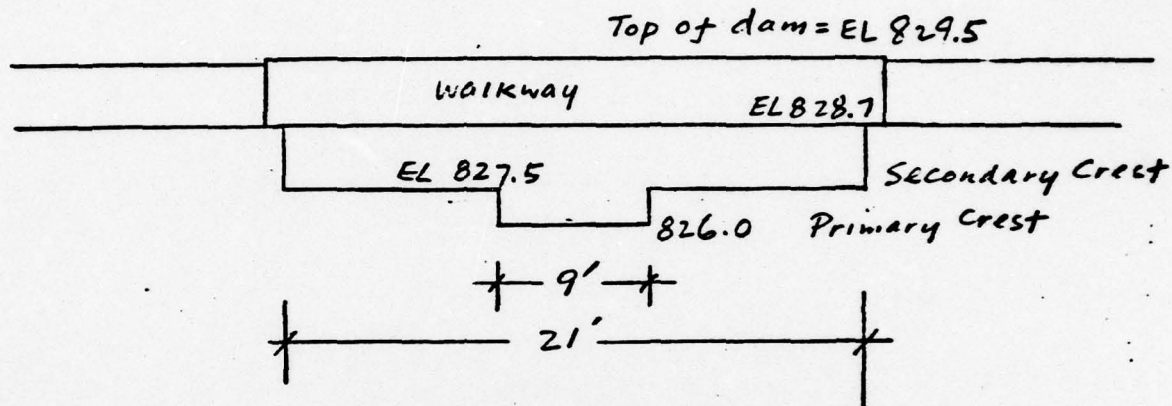
STORCH ENGINEERS

Sheet 5 of 9

Project Dalrymple Pond Dam

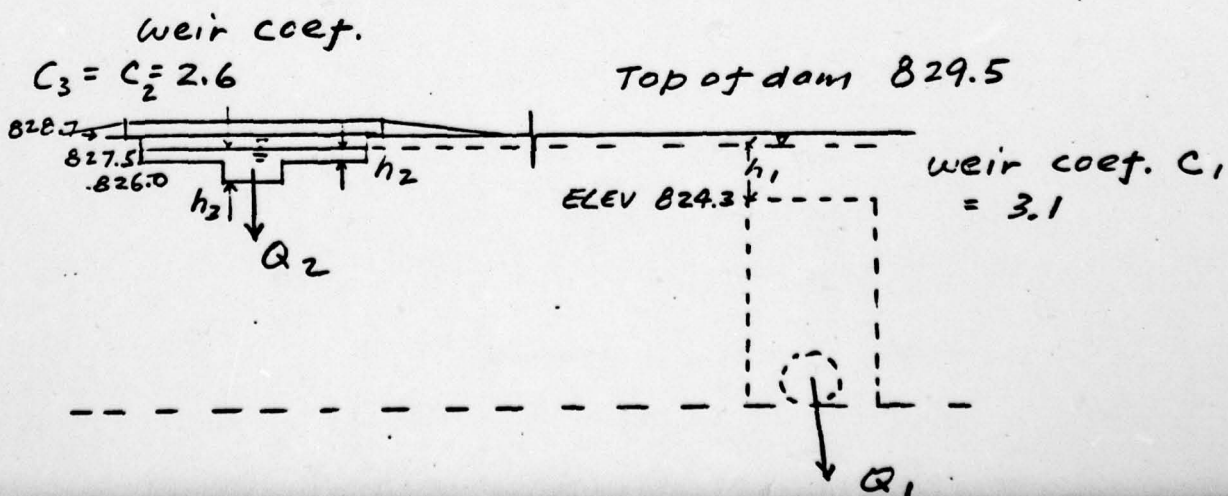
Made By RL Date I-23-79

Chkd By DMSP Date 6-25-79



Auxiliary Spillway 1 SECTION

The stage discharge curve will include inflow over principal & auxiliary spillway as weir flow until controls are developed by 18" RCP and orifice flow by walkway.



STORCH ENGINEERS

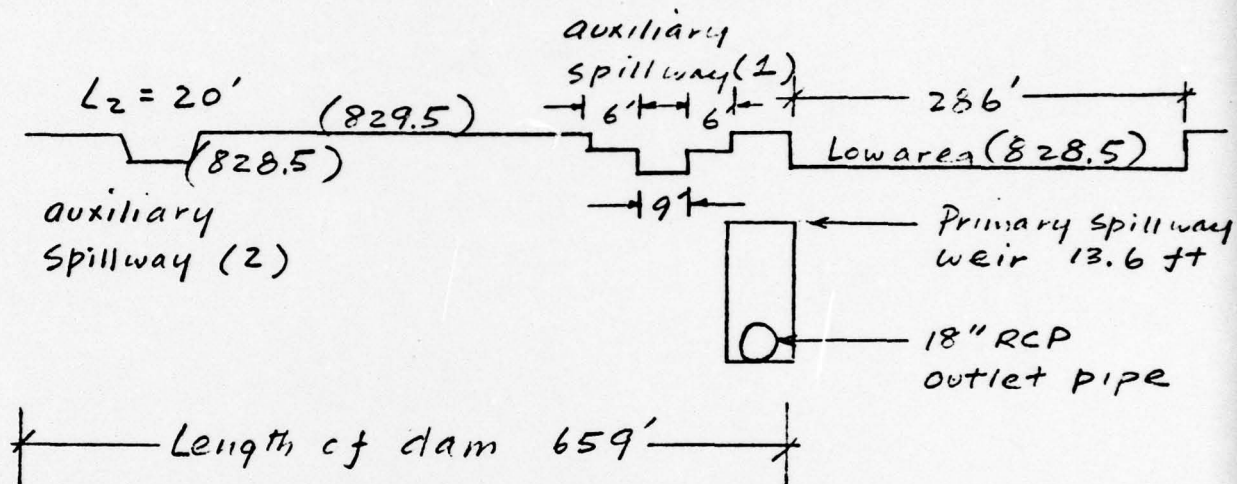
Sheet 6 of 9

Project Dalrymple Pond Dam

Made By RL Date 6-6-79

1132 B

Chkd By DMP Date 6-25-79



Primary spillway discharge controlled

by 18" RCP Throughout

Ref: "Hydraulics of Highway Culverts"

Auxiliary spillway (1) lower level

9 ft long
 $C = 2.6$

upper level

12 ft long
 $C = 2.6$

Auxiliary Spillway (2)

Length = 20'
 $C = 2.9$

Discharges over auxiliary spillway (1), (2)

STORCH ENGINEERS

Sheet 7 of 9Project Delrymple Pond DamMade By RL Date 6-19-791132 BChkd By DMP Date 6-25-79Low area

Length = 286'

C = 2.9

Ref. for C values from "Handbook of
Hydraulics" by King et al.

Orifice flow for auxiliary spillway 1 calculated by

$$Q = CA \sqrt{2gh} \quad \text{at W.L.} = 829.5 \text{ feet}$$

$$C = 0.6$$

$$A_2 = 14.4 \text{ ft}^2$$

$$h_2 = 1.4$$

$$Q_2 = 82$$

$$A_3 = 24.3$$

$$h_3 = 2.1$$

$$Q_3 = 169$$

Stage Discharge Tabulation

W.L. (ft)	Primary Spillway		Auxiliary 1 Upper		Auxiliary 2 Lower		Auxiliary 2		Low area		ΣQ (cfs)
	h_1 (ft)	Q_1 (cfs)	h_2 (ft)	Q_2 (cfs)	h_3 (ft)	Q_3 (cfs)	h_4 (ft)	Q_4 (cfs)	h_5 (ft)	Q_5 (cfs)	
824.3	0	0	0	0	0	0	0	-	0	-	0
825.3	1.0	20	0	0	0	0	0	-	0	-	20
826.0	1.7	24	0	0	0	0	0	-	0	-	24
827.5	3.2	25	0	0	1.5	43	0	-	0	-	68
828.3	4.0	26	0.8	22	2.3	82	0	-	0	-	130
828.5	4.2	27	1.0	31	2.5	92	0	-	0	-	150
828.7	4.4	27	1.2	41	2.7	104	0.2	5	0.2	74	251
			Orifice		Critic						
829.5	5.2	32	1.4	82	2.1	169	1.0	58	1.0	830	1171

STORCH ENGINEERS

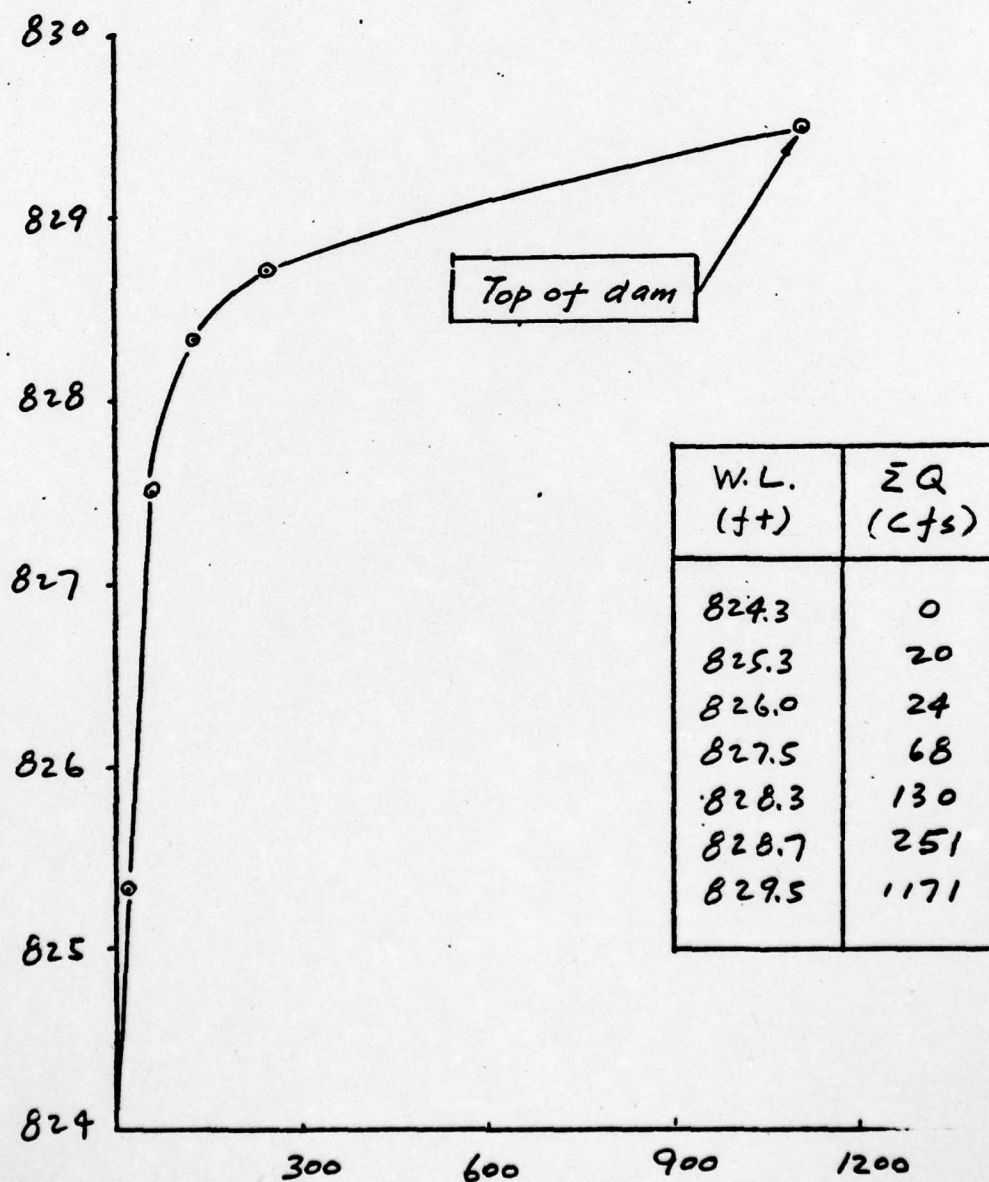
Sheet 8 of 9

Project Dalrymple Pond Dam

Made By RL Date 6-19-79

Chkd By DMP Date 6-25-79

STAGE DISCHARGE CURVE



STORCH ENGINEERS

Sheet 9 of 9

Project Dalrymple Pond Dam

Made By RL Date 5-24-79

Chkd By DMR Date 6-25-79

Outlet Works Capacity

Water level at 824.3

Discharge Through 18" RCP under inlet

Control condition is 19 cfs Ref.

"Hydraulics of Highway Culverts"

Approx. drawdown time

$$24 \left(43560 \times \frac{1}{19 \times \frac{1}{2}} \right) \left(\frac{1}{3600} \right) = \underline{\underline{30 \text{ hr.}}}$$

APPENDIX 5

Bibliography

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